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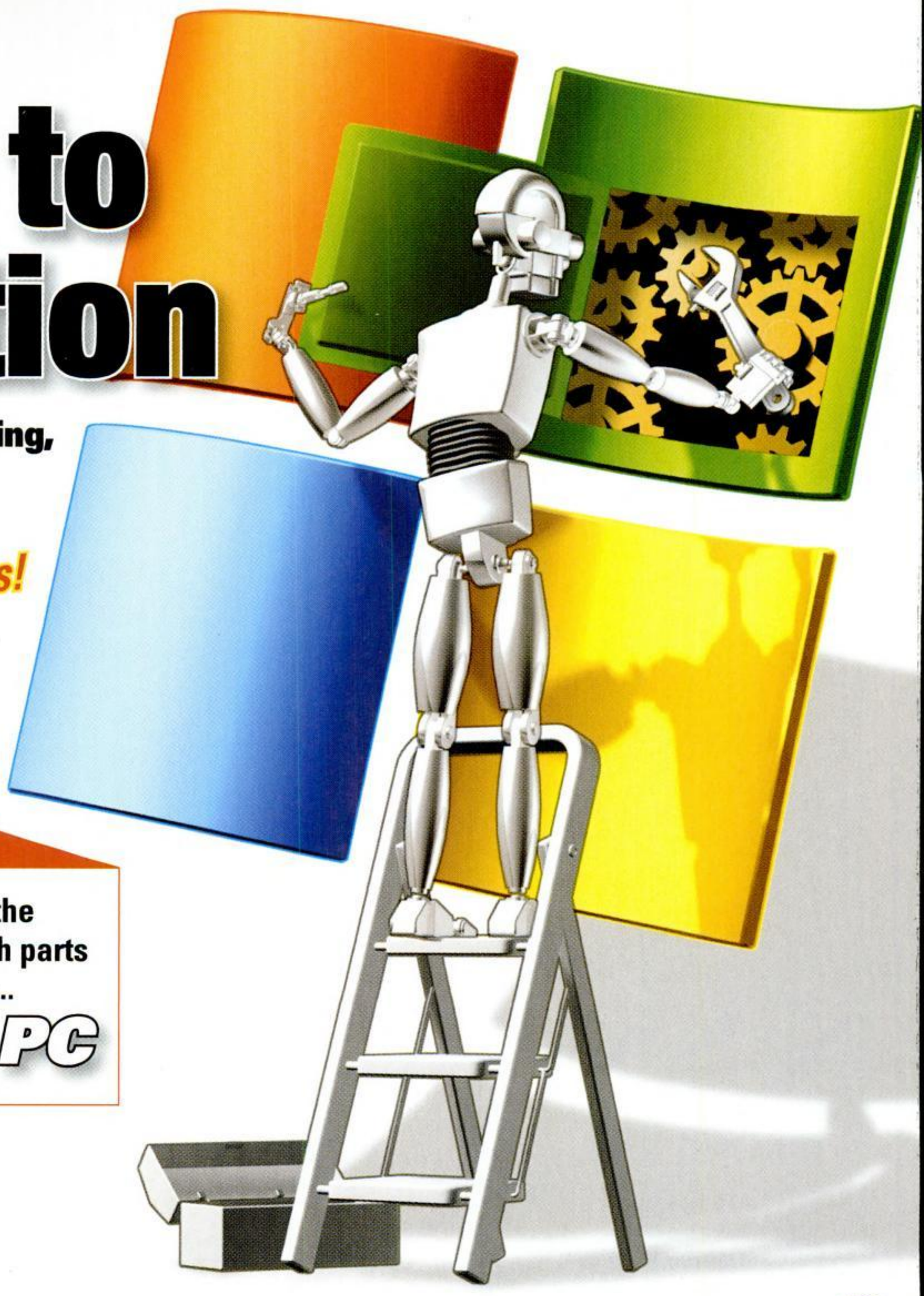

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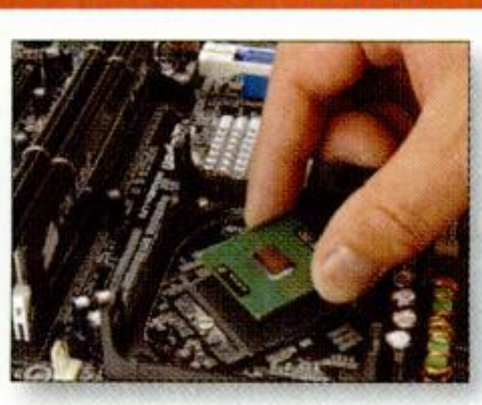

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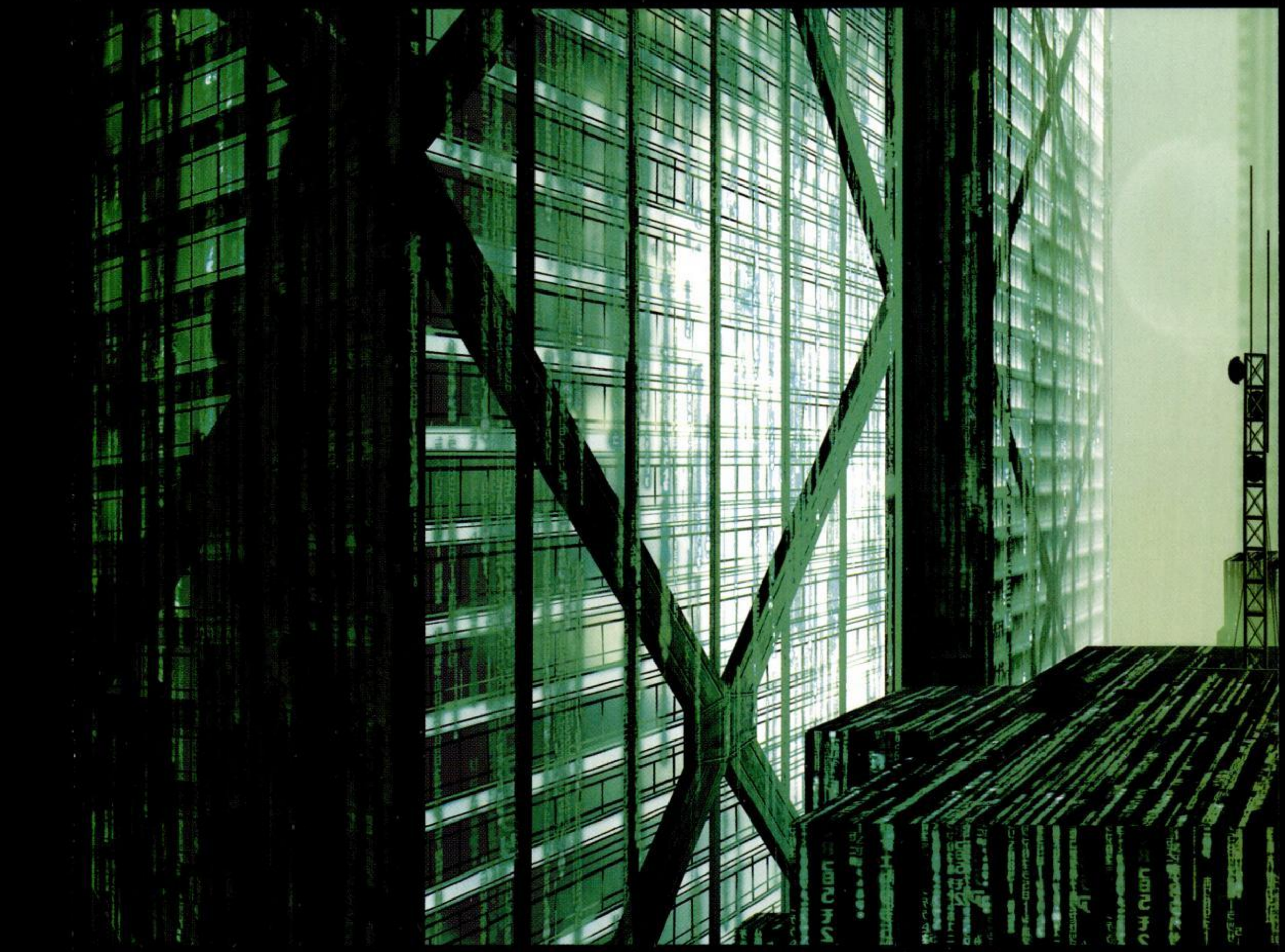

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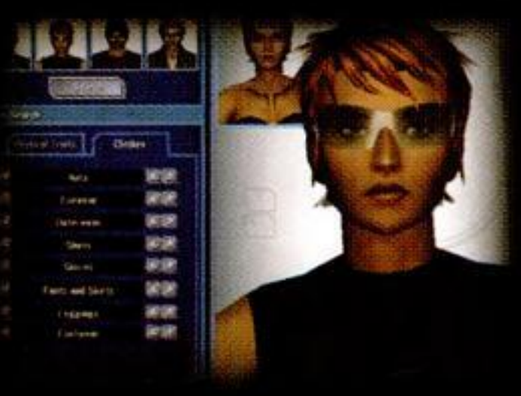

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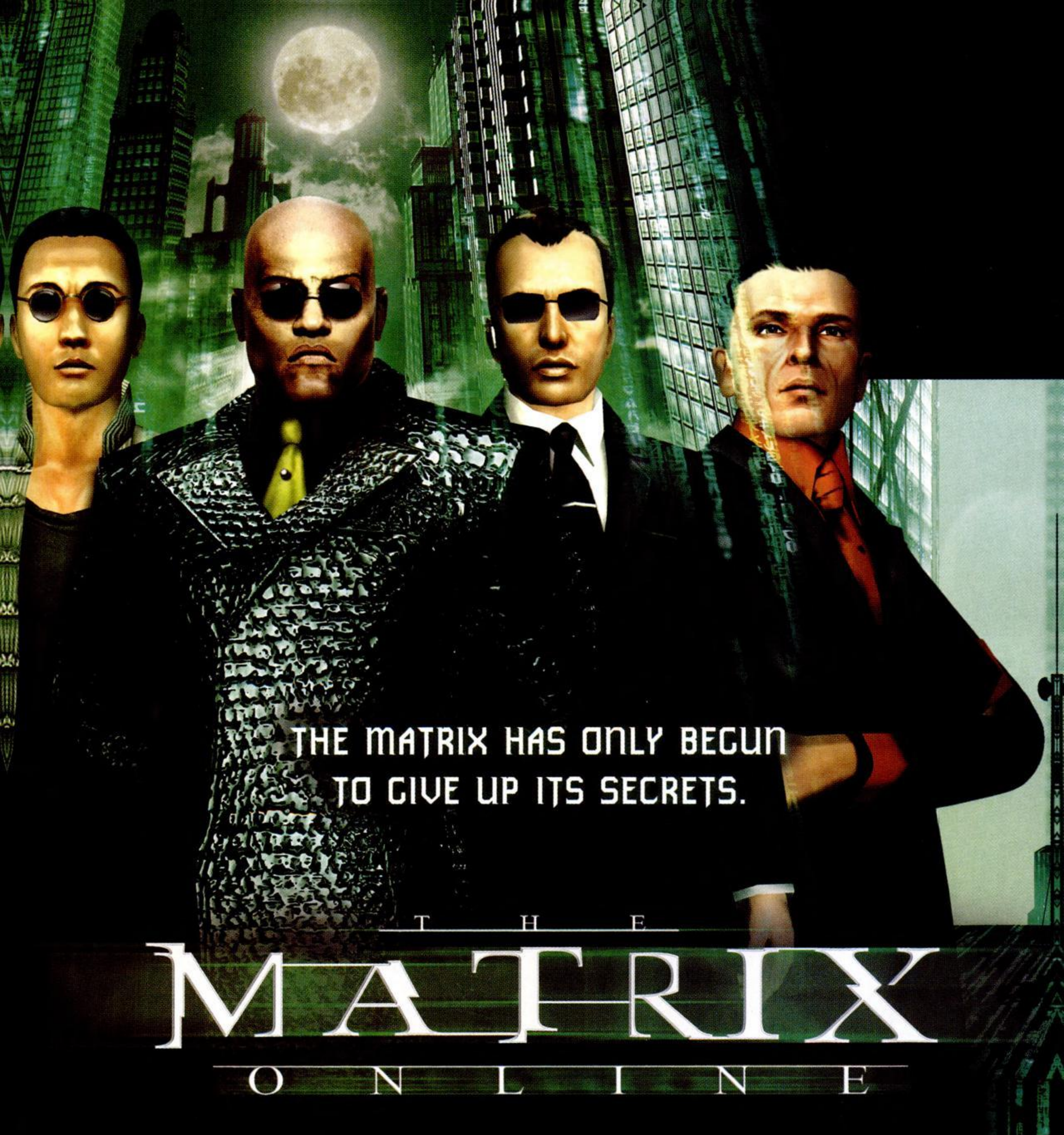

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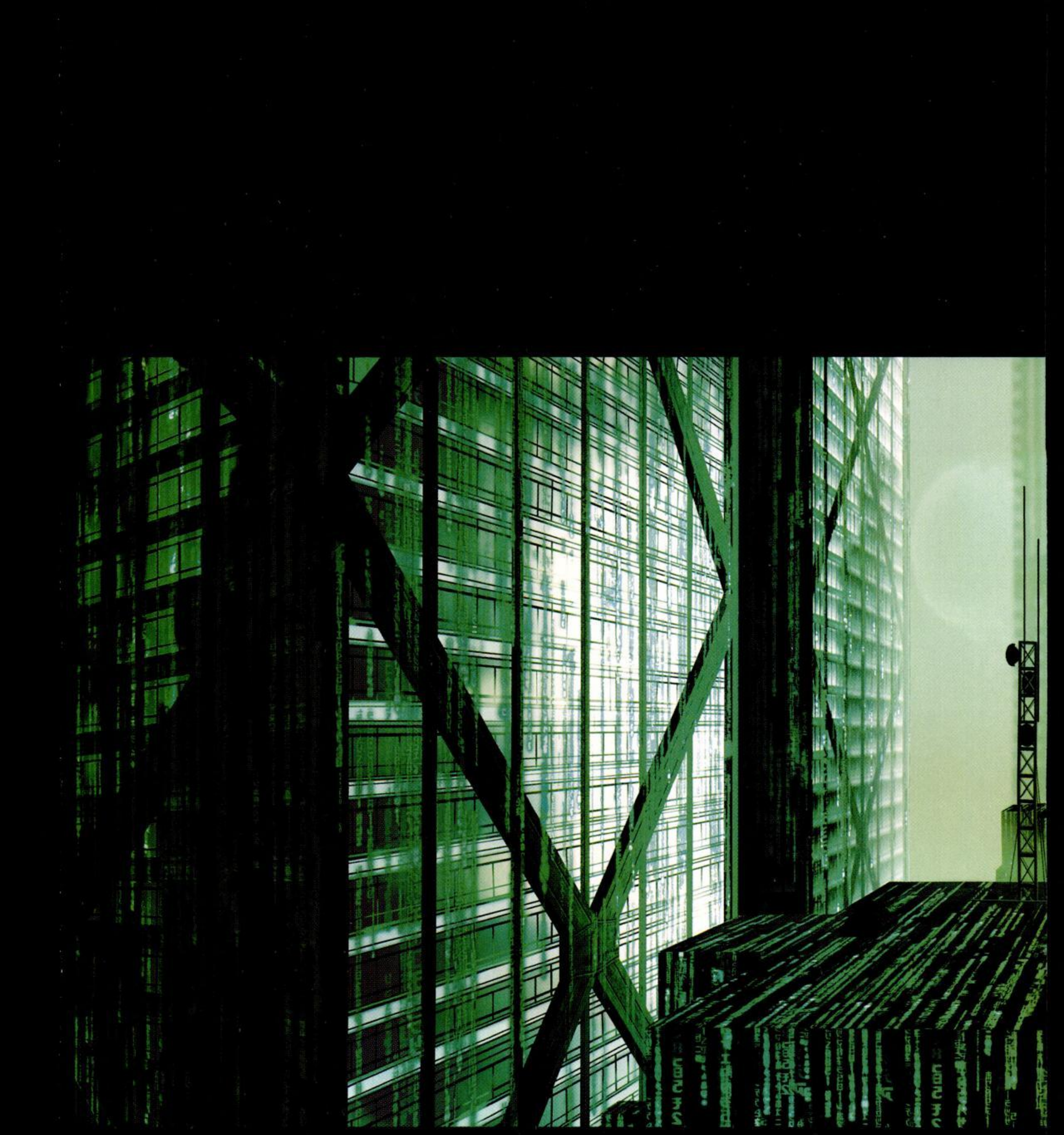

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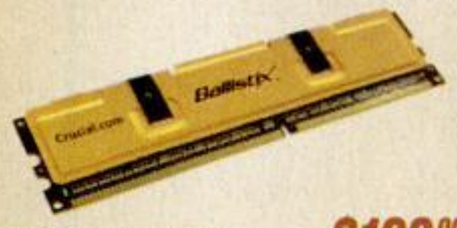

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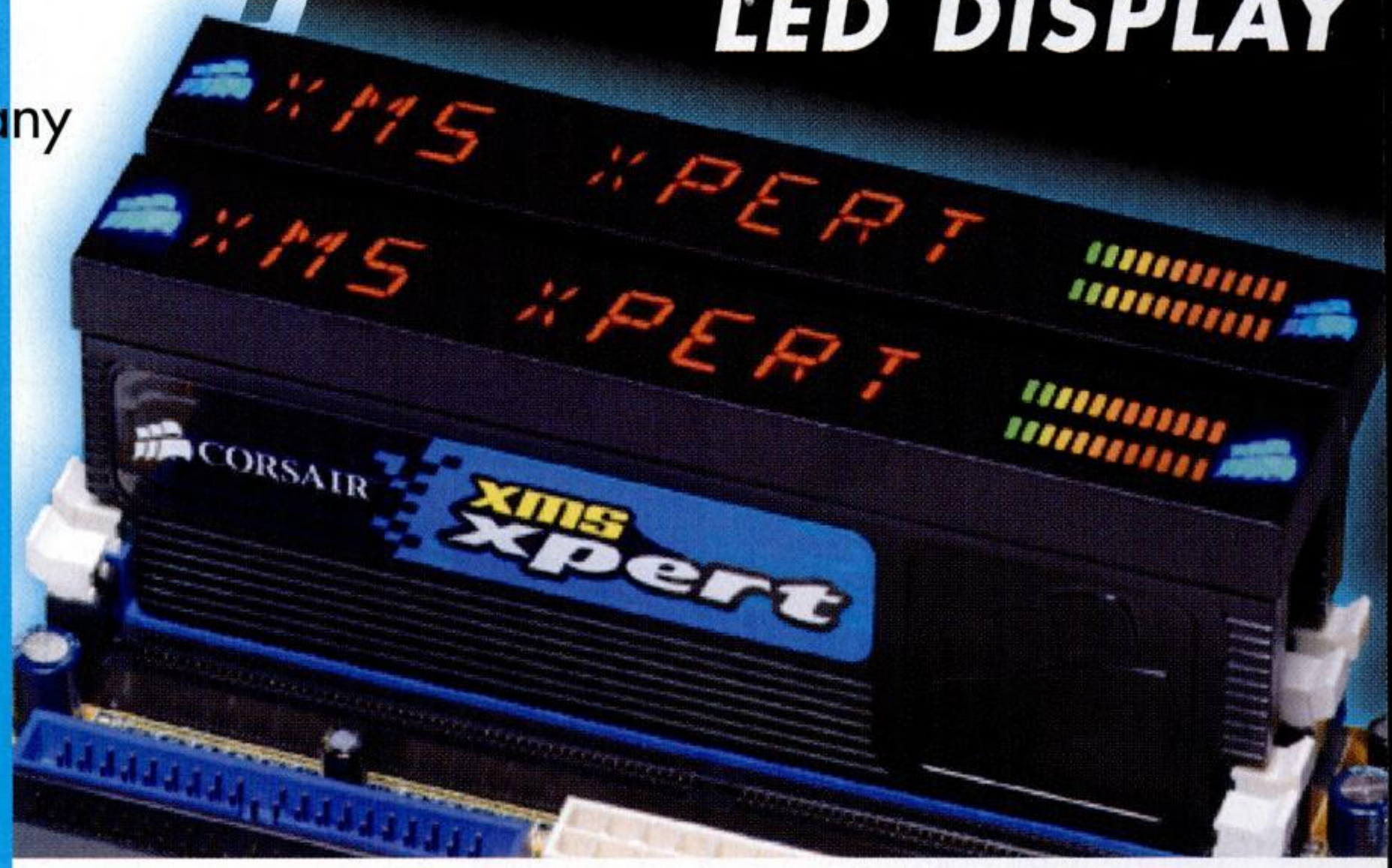

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Release Notes

Alpha to Omega to Alpha

Well, after 13 issues, I find myself saying goodbye. I'm moving on to run my own business. Rather than recount all the good times and the lessons learned during my time here—and rest assured they're too innumerable to measure—I'm going to leave you with a final thought.

Practically speaking, IBM's abandoning of its PC business has no impact on *Maximum PC*'s hundreds of thousands of readers. Still, it was hard not to wince when the originator of the PC—as we know it, at least—waved bye-bye to the business it singularly started. It's a tragedy, right?

Wrong. Of everything I've learned during my stint at *Maximum PC*, one lesson reigns supreme: The PC is what we make of it. Not what IBM, Dell, Alienware, or even L Computers make of it. No—these guys are all following our lead. "Our" meaning the *Maximum PC* universe: the readers, writers, and editors of this amazing magazine.

IBM's original PC dazzled business owners the world over because of its wide-open functionality. You could use it for anything. Prior to IBM's release of the PC, computers were essentially high-priced calculators—narrow in focus, and built/programmed for a single task. The dynamic nature of the original PC literally changed the world.

But after IBM broke the mold with the release of the original PC, the mold somehow was recast. Today, the PC can perform all sorts of marvelous tasks. Check your e-mail. Play games. Manage music. Surf the web. But while computers are popping up everywhere—in cars, planes, cable boxes, even Tivos, the PC is still… a PC. It still sits tucked into a corner of your home on a desk. And you still primarily use it for only a few tasks.

How disappointing. Ten years ago, I thought for sure that by this point in time, the PC and not some "dumb" computer would play a dominant role in my home, my car, my life. Alas, IBM's original dream has held true. It essentially remains a productivity device.

We can change that. We should change that. Just as the origins of the original personal computer lay in the hackers, modders, and electrical device junkies of the 1970s and early '80s, we can elevate the PC's role to greater heights and uses simply by experimenting with it in different capacities. The notion of the Media Center PC is just the beginning. I'm already dreaming of automated kitchens, quick self-service garages. Home brewing. And who knows what else?

But it starts right here with *Maximum PC*, and the ingenious tasks and functions we dream up. Hopefully in 10 years we'll all look back and say to ourselves that the 2004 "demise" of the original PC manufacturer was a good thing, because it allowed us to move on—beyond the realm of PC-as-desktop-device.

—GEORGE JONES

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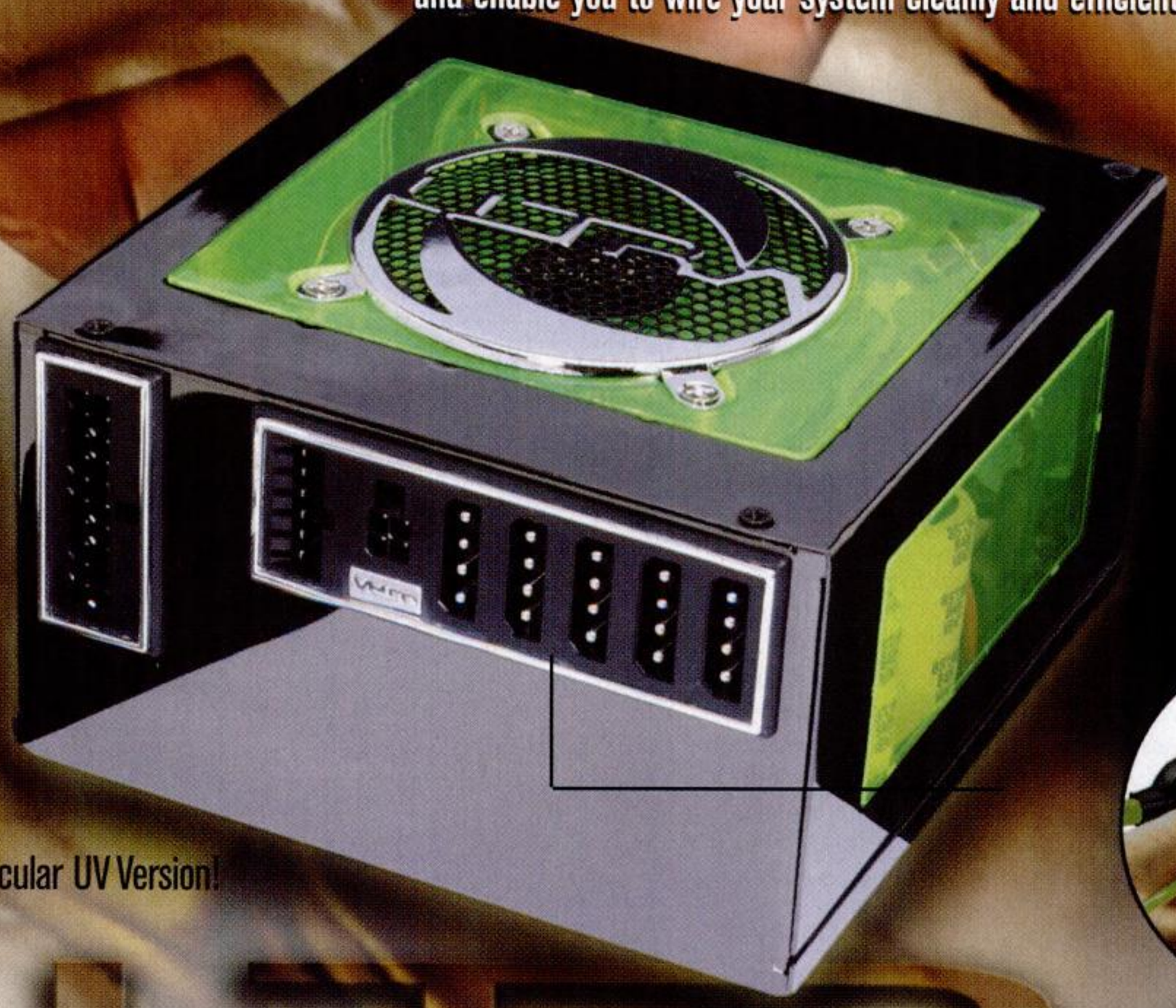

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The Future Network plc is a public company quoted on the London Stock Exchange (symbol: FNET).

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REPRINTS: For reprints, contact Ryan Derfler, Reprint Operations Specialist, 717.399.1900 ext. 167 or email: futurenetworkusa@reprintbuyer.com

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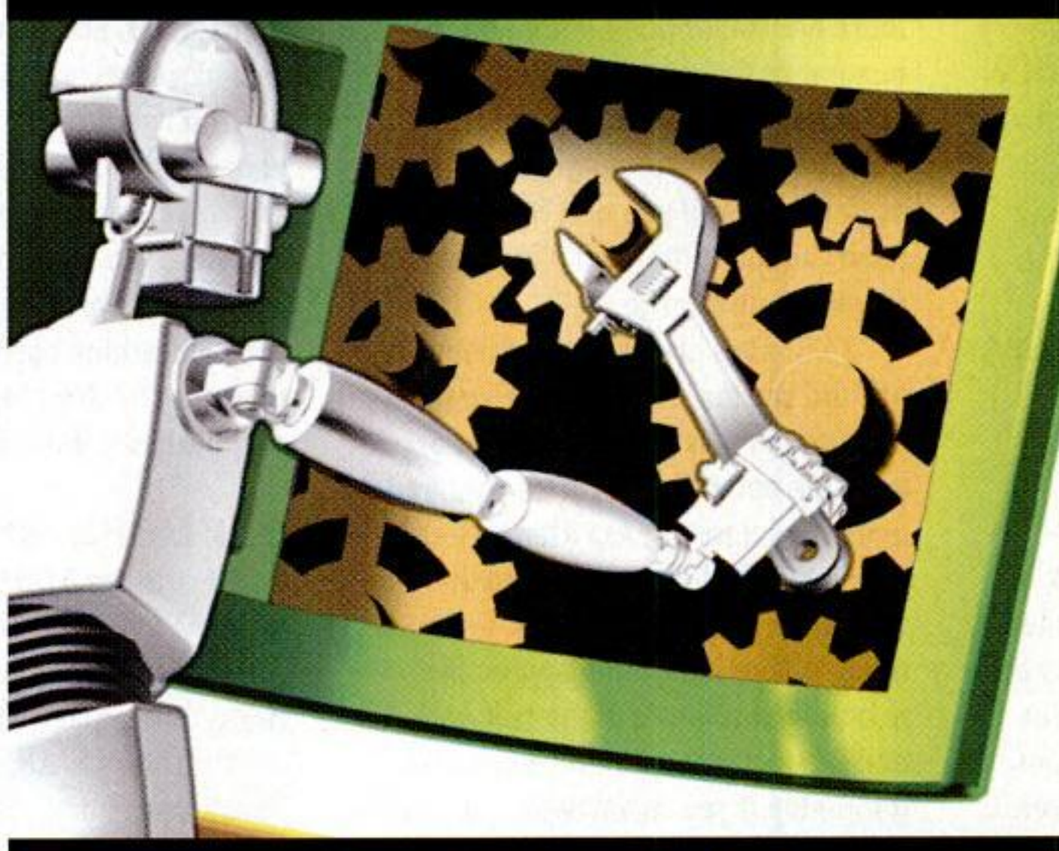

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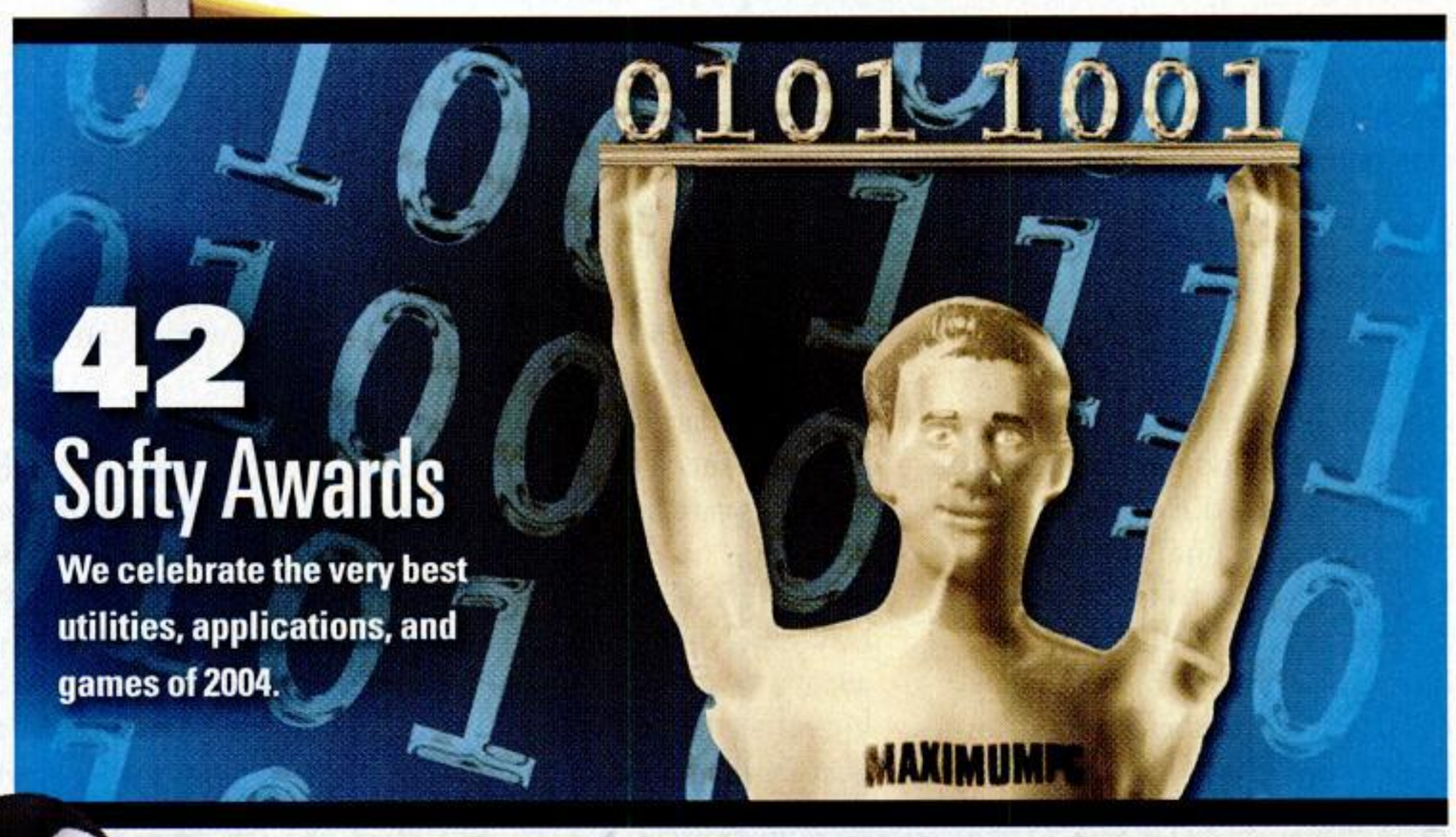
WinXP the Right Way
Install, tweak, and defend your operating system with our time-tested tips.



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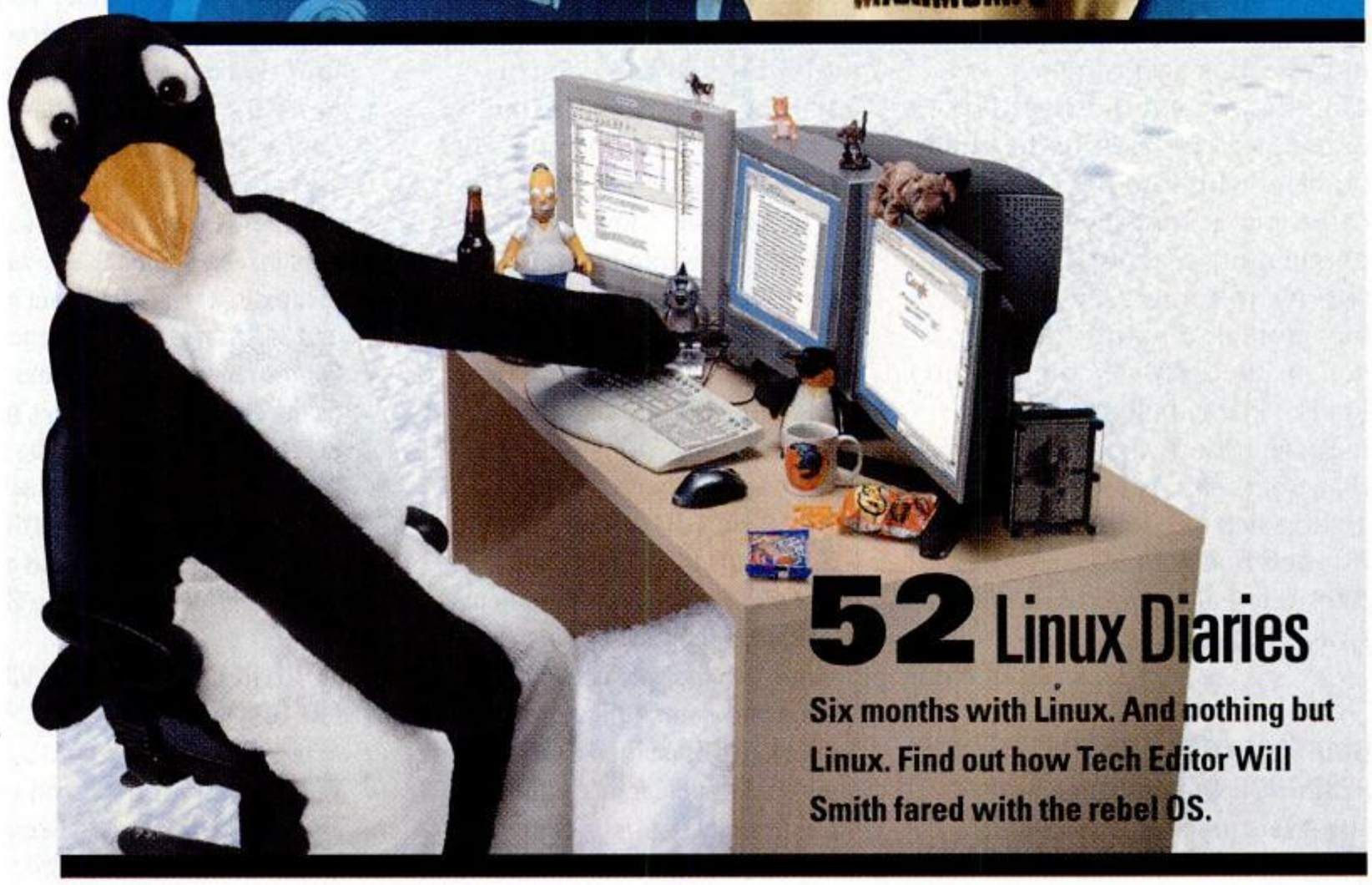
Softy Awards
We celebrate the very best utilities, applications, and games of 2004.



52 Linux Diaries
Six months with Linux. And nothing but Linux. Find out how Tech Editor Will Smith fared with the rebel OS.

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In/Out

You write, we respond

SUPER-SIZE MY SUBSCRIPTION

I was wondering as a subscription holder if I'm entitled to the special issues that you produce? If so, when can I expect arrival? Thank you.

—KEN LINDSAY

MANAGING EDITOR KATHERINE STEVENSON RESPONDS: Unfortunately, the *Maximum PC*-branded "special issues," which are released quarterly, are not included as part of your subscription. They are available only on newsstands. But that shouldn't discourage you from partaking of all the additional useful PC-related information those issues have to offer. Keep an eye out for the Troubleshooting issue, which will start hitting newsstands on March 8.

BLIND SPOT OF PIRATE PROTECTION

Yesterday I was told by Roxio that I have activated my *Easy Media Creator 7* one too many times and will need to buy another license. I have only used this program on my single, personal computer! I should be able to install it as many times as I want. Now, I have to call them to see if I can continue to use the program I already paid for. I understand their concern and their interest in protecting against piracy, but can't they obtain those ends by different means? I have the same problem with Windows XP and *Office*, but at least they give me a phone number to call. Roxio just tells me to contact my vendor to buy more licenses (incidentally, I bought the software online from Roxio). Please help me send a message to software developers that we, their customers, are getting sick of having to jump through hoops to use software we rightfully paid for. I think I'll just switch to *Nero*...

—GREGORY WEST

GOOD COP LOGAN DECKER RESPONDS: We contacted Roxio about your problem, and a representative from the company insisted there has never been a limit on the number of times you can install and activate its software. At the same time, he seemed to contradict himself by saying that if you call Roxio customer support, they will "increase the count" at no charge.

To Roxio's credit, the representative did say that the message suggesting there is a limit to the number of permissible activations will be changed, and we reviewed *Easy Media Creator 7* licensing policies and found them to be uncommonly generous. For one thing, activation is only applicable to online purchases of the software, and Roxio offers a 15-day money-back guarantee if you're not satisfied. And not only are activations unlimited, but Roxio also permits a single copy to be installed on three different machines simultaneously.

We agree that software activation is a pain in the butt that often punishes power users who frequently swap components in and out of their PCs, but in this case, we've got to hand it to Roxio for having policies that are relatively liberal compared with most other software licensing agreements.

A BETTER BIGGER MONITOR?

In your recent Gear of the Year awards (December 2004 issue) you give the HP f2304 the award for Best Display, and it looks like a great pick. My question is whether or not I would be sacrificing anything more than the built-in speakers if I go with the HP L2335? As far as I can tell, the HP L2335 uses the same display and has the same video inputs, only it's around $400 cheaper and doesn't include the built-in speakers, which I wouldn't use anyway. What do you think?

—TREY

MANAGING EDITOR KATHERINE STEVENSON RESPONDS: Good question, Trey. We were previously unaware of the L2335—HP doesn't include that monitor as part of its "Home and Home Office" product line. The L2335 is classified as a business monitor. As such, it has a thinner bezel (for closer tiling of multiple monitors), offers tilt, swivel, height adjustment, and pivot rotation (we like that), and comes without built-in speakers (which, like you, we're not inclined to use, anyway). Otherwise, the two monitors are identical—same excellent screen quality and versatile interface options. It seems to us that for $400 less, the L2335 is definitely the way to go.

HELP ME FILL MY SOCKET 940

In December 2003, I built a new PC using the 940-pin AMD 64 FX-51 with an nForce3 chipset on an Asus motherboard. AMD said it would carry the 940-pin until the end of the year but I've been unable to find a 940-pin AMD 64 FX-55. After doing some checking around town, I found out I could jump to an Opteron processor. First, is there a 940-pin FX-55 and, if so, where can I get one?

—FRANK QUILLEN

SENIOR EDITOR GORDON MAH UNG RESPONDS: Unfortunately, AMD doesn't make an Athlon 64 FX-55 for the Socket 940 platform and has no plans to do so. Once AMD introduced its Socket 939, it decided to push consumers to the new platform, which doesn't require the use of registered RAM. We are also disappointed by AMD's failure to support the Socket 940 platform as long as was previously expected.

There is some recourse, though. The Socket 940 should be compatible with just about any 1XX and 2XX series Opteron processors. For the most part they're the same as the FX chips. Right now, the Opty tops out at 2.4GHz, the same speed as the FX-53. We expect AMD to eventually introduce a 2.6GHz version Opteron which should offer similar performance to the FX-55.

THANKFULLY, THERE WAS NO SPACE FOR THE PIC

I had to let you know that you ripped an involuntary chuckle from me as I read your Head2Head in the

MAXIMUM PC GOES TO THE MOVIES

We often get letters from readers about the screenshots that appear in our magazine. Some questions reflect the sophistication and good taste characteristic of *Maximum PC* readers ("Was that image taken from Jeunet's *City of Lost Children*?"). Others reflect interests of a more personal nature ("Who was that totally hot Japanese chick?"). For your edification and cultural enrichment, we reveal the top six movies we use for video testing.

Battle Royale, Special Edition DVD

City of Lost Children

Not Without My Handbag (from Nick Park's "Creature Comforts" DVD)

Crouching Tiger, Hidden Dragon (Superbit Edition)

Jason and the Argonauts

Spirited Away

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December 2004 issue. I wouldn't normally expect to see a comparison drawn between the difficulty in deciding which CPU is faster and a pharmaceutical ad including a warning about "yikes!—anal leakage."

—KEN BUTTERS

REDUNDANCY IS ALL IN THE EYE

I thoroughly enjoy reading (most of) your words on a monthly basis, however I do feel I should point something out to you: The N in "PIN" represents the word "number," the D in "LCD" stands for "display," the M in "ATM" means "machine."

So, "PIN number," "LCD display," and "ATM machine" (for example) are *redundant*. Considering I've seen "LCD display" in almost every issue of *Maximum PC* over the past year, I think it's finally time to point this out.

—BILL MELCHER

SENIOR EDITOR GORDON MAH UNG RESPONDS: I'll agree that ATM machine is redundant and so is PIN number, but LCD display isn't necessarily so. A CRT display is a display that uses CRT technology. An LCD display is a display that uses LCD (liquid crystal display) technology. LCD specifically refers to the actual glass panel within the monitor, or display. Would it be wrong, to say "I have a display that uses LCD technology?"

PC POWER AND COOLING CEO WEIGHS IN

Even though *Maximum PC* awarded our Turbo-Cool 510 power supply a Kick Ass award [in the January issue's power supply roundup], we take issue with the methodology of the reviews and the conclusion that, while close, the Turbo-Cool 510 is no longer the "top dog."

1. The PC Power and Cooling Turbo-Cool 510 beats the Antec Neopower 480 in every category of power supply performance and reliability. The 510 has 30% more peak power, 10% wider input range, 100% longer hold time, 3X better voltage regulation, 50% less output ripple, and a 2-year longer warranty.

2. The reviews were represented as "torture tests," but amazingly, the units were not tested at full load or at elevated temperature. Instead, they were tested at 60%-70% load. In essence, our competitors received a free pass. No one had to prove their wattage claims.

3. Because they are popular today, points were given for modular plugs, a feature that actually degrades performance and reliability. Pros specify straight wire. They know extra connectors add resistance, limit power, and create a failure point caused by burned or loose pins. Because PC Power and Cooling customizes power supplies in California, we can supply the exact output harness a customer needs.

4. In order to compare apples to apples, wattage claims must state the maximum ambient temperature for continuous, full-load operation. The Turbo-Cool 510 is rated for 510W continuous at 50 degrees C. Many competitors assume an ambient temperature of only 25 degrees C. If they had to certify their units for full-load at 50 degrees C, their power would derate by over 50%.

5. Antec's warranty states that they do not cover product used in commercial or industrial applications. This is an amazing limitation. It is only logical that a power supply rated and warranted for commercial and industrial use would require much more cooling than one rated for casual use. This fact must be taken into account when comparing products for noise level.

6. Even though the price listed in the review for the Turbo-Cool 510 is $220, it's usually available on our web site for $197. When you compare the Turbo-Cool 510's quality and performance to any other unit on the market, and take into account its commercial rating, it's remarkable the price differential is so low.

In conclusion, there's no doubt the Turbo-Cool 510 is still the industry's top power supply.

—DOUG DODSON, CEO PC POWER AND COOLING

SENIOR EDITOR GORDON MAH UNG RESPONDS: We don't dispute that PC Power and Cooling is top dog in performance. The company's PSUs have long been recognized as the Mercedes Benz of power supplies. However, the Antec Neo 480 is less expensive and held up well in our load tests. That and convenient cables gave it the slight edge in our verdict. While it's true we could have added a couple more items to the load, we were already using a 3.4GHz Prescott, 3GB of RAM, a GeForce 6800 Ultra, two 7,200rpm ATA drives, two 15K SCSI drives, and two optical drives in a room heated to a sweltering 100 degrees Fahrenheit. At that time, it wasn't realistic to add more hardware to a desktop, but now with SLI on the scene, perhaps a rematch will help clear up any concerns. ■

LETTERS POLICY: *MAXIMUM PC* invites your thoughts and comments. Send them to **input@maximumpc.com**. Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

CUT, COPY, PASTE

A review of the Canon EOS 20D in the December issue of *Maximum PC* incorrectly referred to the Nikon D2X instead of the D2H.

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QuickStart

The beginning of the magazine, where articles are small

Steady as She Goes for AMD in '05

New roadmap points to dual-core CPUs, and smaller die sizes across the board

You can say that AMD had one hell of a year in 2004. The CPU maker reclaimed the performance crown, saw increasing support for its server processors, and, in the ultimate victory, forced Intel to support AMD64 instructions.

AMD's plans for next year don't seem quite as ambitious, but that doesn't mean things won't be interesting. AMD still believes it will be the first to market with a dual-core CPU for the PC—it has a dual-core 90nm CPU dubbed Toledo penciled in for the second half of 2005. But the bigger change for AMD in 2005 will be an across-the-board die shrink from 130 nanometers to 90 nanometers for all its consumer-level CPUs.

AMD actually released some CPUs using its new 90nm fab process in 2004, and in 2005 every new processor release will feature the 90nm die size along with Silicon On Insulator, or SOI, which helps lower capacitance in processors and reduces power consumption.

In 2004, AMD also implemented a new fabrication technique known as "strained silicon"—a way to stretch atoms in the chips to help speed the flow of electricity—but used it on just one CPU: the Athlon 64 FX-55. In 2005, AMD will continue to use strained silicon, but only where it needs to hit higher clock speeds rather than across its entire line of CPUs. All AMD CPUs will continue to be fabricated at the Dresden, Germany, plant on FAB30 and a new line called FAB36 once it's completed.

AMD's 2005 roadmap reflects the same product-introduction strategy it used last year. Its top-end Athlon 64-FX series will feature the most cache and the highest clock speeds, and as the FX CPUs are retired, it's possible they'll be rebadged as Athlon 64 chips. AMD performed this switcharoo in 2004 when it introduced its Athlon 64 4000+, which for all intents and purposes was a rebadged Athlon 64 FX-53.

Whether or not this conservative strategy will help AMD snatch more market share from Intel is anybody's guess, but it seems to have worked in 2004. According to Dean McCarron, principal analyst of Mercury Research, AMD's market share has slowly grown against Intel but it's still less than its peak. McCarron said his numbers put AMD at about 15.8 percent of the market for the third quarter of 2004. That's up a tick from the third quarter of 2003 when AMD had 15.1 percent of the market. That means

that roughly 15 out of every 100 PCs sold had an AMD processor. McCarron said AMD's high point was in 2001 when it hit 22 percent market share, which meant almost one out of every four PCs bore an AMD badge.

Even though the number of units sold is lower, McCarron said AMD is actually in better financial shape today than it was in 2001 when its number one priority was to move CPUs even at a loss. Today, AMD is able to charge more for its processors and thus make more profit. AMD has also done surprisingly well in the increasingly popular PC notebook market and has even made gains in the prestigious server market, McCarron said.

One huge question that remains unanswered is when AMD will finally adopt DDR2. Because AMD will have to substantially rework its current architecture to meet the spec, it's anyone's guess when it will happen.

AMD's 2005 Roadmap Demystified

FIRST HALF OF 2005

CPU CODE-NAME	WHERE IT WILL BE USED	WHAT IT IS
SAN DIEGO	Desktop power systems	The San Diego core will be AMD's top-gun desktop processor and will power the Athlon 64 FX line of CPUs. It will likely boast 1MB of L2 cache and will definitely run at the highest clock speeds AMD can achieve. Erroneous reports pegged San Diego as the FX-55. It's not. The San Diego will likely be a Socket 939 processor with dual-channel DDR support. Perhaps it will have SSE3 instructions a la Prescott P4 and tweaks to make it faster. Projected clock speed will probably be 2.8GHz or higher. It might be named FX-57.
VENICE	Midrange and power desktop systems	The Athlon 64 series will mostly be based on the Venice core. Just think Athlon 64 FX with some of the cache turned off for marketing or QA reasons. Because AMD has offered Athlon 64 with both 1MB and 512K of L2, you'll likely see both versions at different clock speeds from 2.6GHz and lower in Socket 939 and perhaps Socket 754.
PALERMO	Budget desktop systems	The Palermo core will power AMD's Sempron chip, aka the new Duron. It's basically an Athlon 64 core with the 64-bit features turned off and cache disabled. Don't expect this in an old-school Socket A either; it'll probably be Socket 754 only.
LANCASTER	Portable and ultra-portable notebook computers	AMD's sequel to the 90nm SOI LV chip it released last year, the Lancaster will duke it out with Intel's higher-clocked Centrino CPUs. It'll probably come with 1MB of L2 cache and ship in Socket 754, which means it'll feature single-channel RAM support.
NEWARK	Portable and "desk/note" computers	Hotter and more power hungry than the Lancaster, the Newark will take the place of the "normal" Mobile Athlon 64 CPUs in the 5-to-7 pound notebook category and offer a fair balance of battery life and power.
GEORGETOWN	Budget notebook computers	AMD's Mobile Sempron budget CPUs will get a shrink from 130nm to 90nm, which should be easier on the thermals and battery life.

SECOND HALF OF 2005

TOLEDO	Desktop power systems	AMD's first dual-core chips will share the memory controller in the core and are expected to pack 1MB of L2 cache. Not much is known about clock speed but it's possible both Intel and AMD will introduce dual-core CPUs at clock speeds that are slower or equal to the fastest desktop chips available at the time.
ROMA	Budget notebooks	Not much is known about Roma.
ALBANY	Budget notebooks	Not much is known about Albany, but because it won't have low-voltage technology, we suspect it'll go into budget notebooks in the 6-to-8 pound range and have just average battery life.

FAST FORWARD BY TOM R. HALFHILL

Kill the Clock

Everyone knows AMD and Intel are turning away from stratospheric clock speeds and moving toward chips with multiple processor cores. But what if someone made a microprocessor that doesn't have a fixed clock speed at all? Believe it or not, it's been done, and a recent development has revived interest in this oddball technology.

It's called asynchronous logic, and it requires some explanation. Almost all existing processors synchronize their internal operations to a regular heartbeat known as a clock signal. The signal is an electrical pulse that tells the transistorized gates when to perform their logic functions. A processor's clock frequency is the number of ticks per second. It's all very regulated, like musicians playing to the steady beat of a drum. This dominant type of logic circuit is called synchronous logic.

Asynchronous logic marches to the beat of a different drummer—actually, to no drummer at all. The logic circuits can operate as fast as they want, even if it's faster or slower than other circuits on the same chip, and are not regulated by a global clock signal. Therefore, an asynchronous processor doesn't have a fixed clock frequency. Parts of the chip might run at 1GHz while other parts run at 2GHz, or anything in between.

The advantage of this approach is greater efficiency. A processor's instruction pipeline is like a factory assembly line: Program instructions enter at one end, pass through sequential stages of execution, and finally emerge with the calculated results. In a conventional processor, instructions move steadily through the pipeline, even if one stage is faster than another. Slower stages can delay faster stages. In an asynchronous processor, each stage can work at its own pace. Asynchronous logic works as fast as it can, and when it's done, it's done.

Of course, it's not quite that simple, or asynchronous logic would have caught on long ago. One challenge is orchestrating the untimed logic to keep a downstream circuit from activating before receiving the data it needs from an upstream circuit. (Imagine a factory worker trying to attach a wheel to a half-finished car without an axle.)

Two European companies, ARM and Handshake Solutions, recently announced the first commercially available 32-bit asynchronous microprocessor core. It's designed for low-power applications, like cellphones. Other companies are watching closely. It could herald a better way to juice up performance without the power and heat problems afflicting today's superfast processors.

Tom Halfhill was formerly a senior editor for Byte *magazine and is now an analyst for* Microprocessor Report.

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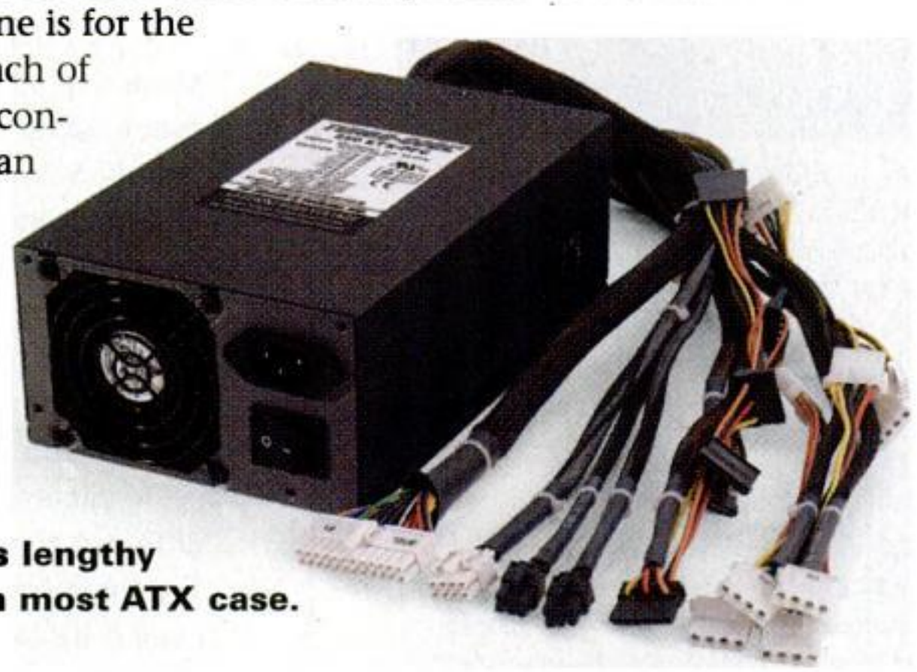
More Power, Scotty!

Muscle-bound 850 watt power supply debuts

If you're contemplating building an SLI system in the near future, you're probably wondering where the heck you'll find a power supply beefy enough to juice two nVidia 6800 videocards. PC Power and Cooling has the answer. Its upcoming Turbo-Cool 850 Deluxe is an all-black monstrosity capable of powering an SLI system and then some with its 850-watt continuous power output and 950W peak power rating.

In its stock configuration, the Turbo-Cool 850 Deluxe includes the requisite dual six-pin PCI Express connectors needed to power two PCI Express videocards, as well as an obscene 15 connectors for drives, including six Serial ATA power cables, eight four-pin Molex connectors, and a floppy power cable. The PSU is designed to provide a separate 12V power rail for each of a PC's sub-systems. Of the four 12V rails, one is for internal drives, one is for the CPU, and the final two are for each of the videocards. Custom harness configurations are also available for an additional cost.

Cooling is provided by a single temperature-controlled 80mm fan. The PSU will retail for $430 and include a five year warranty. Fore more info check out **www.pcpowerandcooling.com.**

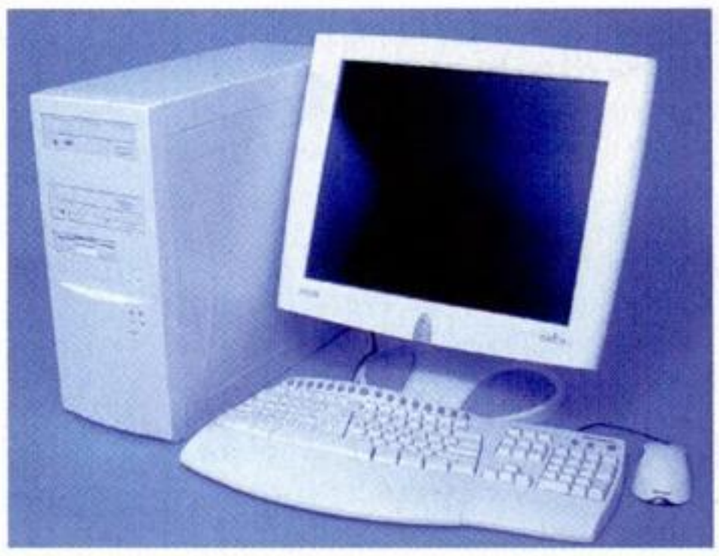


Don't be alarmed by the PSU's lengthy formfactor—it'll fit just fine in most ATX case.

Breaking News

Average PC User Has an Average PC

Users of Valve Software's controversial content delivery system named Steam are asked to take part in an anonymous hardware survey upon installation, and as of December 2004 more than 1.3 million people had agreed to upload their PC configs. The results are staggering, at least to those of us living in a perpetual upgrade cycle. Of the survey's respondents, the majority had the following PC configuration.



SURVEY SAYS...	
CPU	2.0GHZ – 2.3GHZ, MADE BY INTEL
RAM	256MB – 512MB
VIDEOCARD	Radeon 9800 series
OS	Windows XP
NET CONNECTION	256Mb/s
DISPLAY RES	1024 x 768, 16-bit
PREFERRED OPTICAL	DVD-ROM
FREE HD SPACE	10GB – 20GB
TOTAL HD SPACE	70GB – 80GB

Results from the survey are updated daily, and can be examined at www.steampowered.com/status/survey.html

FUN-SIZE NEWS

IBM FLEES PCs

IBM sold its personal computer division for $1.25 billion to Lenovo in an agreement that will allow China's largest PC maker to continue using the "Think" trademarks (such as ThinkPad) for another five years. The deal will allow IBM to focus on its higher-margin gigs like servers and storage devices, while giving Lenovo instant brand recognition here in the states.

SPYWARE VS. SPYWARE

Imagine having your syphilis sued for wiping out your gonorrhea. That's what's going on in a Seattle courtroom as two competing contextual-advertising service companies battle over tactics. See, when you install New York-based DirectRevenue's software, it detects and deletes Curacao-based Avenue Media's own *Internet Optimizer* from your system. Avenue Media claims this exceeds "authorized access" to users' computers, while DirectRevenue defends itself by saying its end user license agreement explicitly permits it to do so.

LAPTOPS: POACHING YOUR EGGS?

Dr. Yefim Sheynkin of the State University of New York at Stony Brook has a stern warning for salarymen everywhere. After studying 29 volunteers between the ages of 21 and 25, his research team found that using a laptop on the lap—where it presumably belongs—raises scrotal temperatures by an average of 2.7 degrees Celsius shortly after boot up. Dr. Sheynkin cautioned that long-term exposure to this "scrotal hypothermia" could have a "detrimental effect on their reproductive health."

BLU-RAY VS. HD-DVD, ROUND XII

New volleys have been launched on both sides of the next-generation DVD standards war. HD-DVD humiliated Blu-Ray when it announced the backing of four major motion picture studios (Paramount, Universal, Warner Bros., and New Line Cinema) as well as a dual DVD/HD-DVD disc that would be backwards-compatible with classic set-top DVD players. Blu-Ray shot back with news that it had secured support of Disney's home entertainment division, and that Sony's PS3 game console would use Blu-Ray technology.

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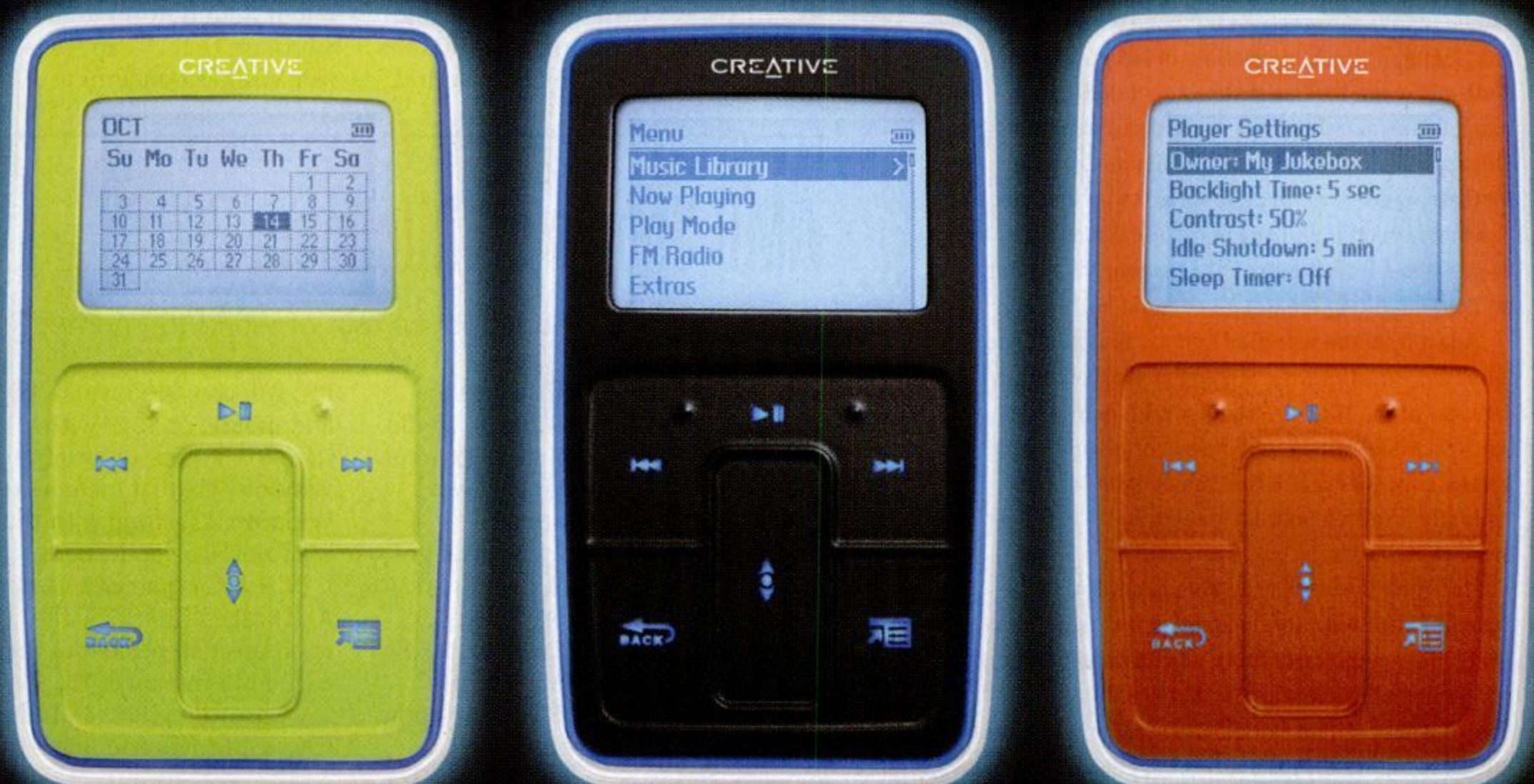
MICRO



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GAME THEORY BY THOMAS L. McDONALD

Rated 0 for Obvious

Gamers got a good chuckle this past November with the release of a list detailing the 10 Most Dangerous Video Games of the holiday season, sponsored by the Interfaith Center on Corporate Responsibility (ICCR) and a group of allied organizations that care very deeply about you, your children, and little dots on a screen that faintly approximate the appearance of real things.

I can't argue with the violent content of many titles on the list (even the two games from the list that don't even exist). Apparently, neither can the creators and publishers of these games, because they gave them all an M-rating. Now, I wouldn't allow my first-grader to play *Doom 3* or *Half-Life 2* or *Postal 2,* but it stands to reason that most parents should able to differentiate between a hellknight and SpongeBob while standing in the PC game aisle and make their purchases accordingly. But what if some parents can't make this distinction? This nightmare scenario keeps Pamela Eakes of Mothers Against Violence in America up at night: "I wonder what it will say to a child if they receive such a game from a parent or grandparent, no matter how unwitting the gift giver might be."

Apart from the mangled syntax, that sentence takes the breath away. Sister Pat Wolf, executive director of the ICCR, weighs in with more mendacity: "Many adults who have not played video games may not realize that these 'games' will typically force an impressionable child to kill in order to 'win.'"

Note that the words she puts in quotes are "games" and "win" (two objective facts), but not "kill" (not an objective fact). It is an actual game, and you may in fact win at it, but absolutely, positively no one will be "killed" before, during, or after the game unless they file down the edge of the disk and use it to saw open their carotid artery.

And if they wanted to help, why pick only 10 titles? There are far more than 10 M-rated games out this season. If they really wanted to help, they'd list them all and provide content information, which is handily available right on the box. Of course, if they just repeated what people already know, who would pay attention to them? Worse, how would people know where to find the little "donate" button on the ICCR web page?

Thomas L. McDonald is a conservative, a devout Catholic, a fourth grade catechism teacher, and a gamer. He does not find these facts mutually exclusive.

nVidia and Intel Join Forces

nForce chipset is no longer AMD-only

For years the hardware community has speculated about the existence of an nVidia chipset for Intel CPUs. As quickly as the rumors were circulated, they were batted down.

That all changed this winter when nVidia and Intel officially announced a deal that would finally bring nForce chipsets to the Intel camp. The deal, inked in late November, gives nVidia access to the frontside bus for Intel CPUs.

nVidia is expected to offer chipsets for the Pentium 4 early this year, with motherboards expected as early as February or March. nVidia isn't the only company with access to the P4 bus. ATI, SIS, and ULI all hold licenses to build core-logic chipsets for the P4. Chipset maker VIA also inked a deal last year after a long legal battle with Intel.

In the past, rumors that a deal like this was in the works were scuttled, with nVidia citing such reasons as the high price of the license and the company's reluctance to give Intel access to its intellectual property. nVidia officials haven't offered specific reasons for its newly forged relationship with Intel, but it likely has something to do with nVidia's nForce4 SLI technology. Although Intel's Xeon chipset, the E7525, was the development platform for SLI, Intel doesn't have an SLI offering for the Pentium 4. By letting nVidia build nForce4 for Intel CPUs, the P4 will be better able to compete with AMD's Athlon 64 CPUs, which are already available with SLI.

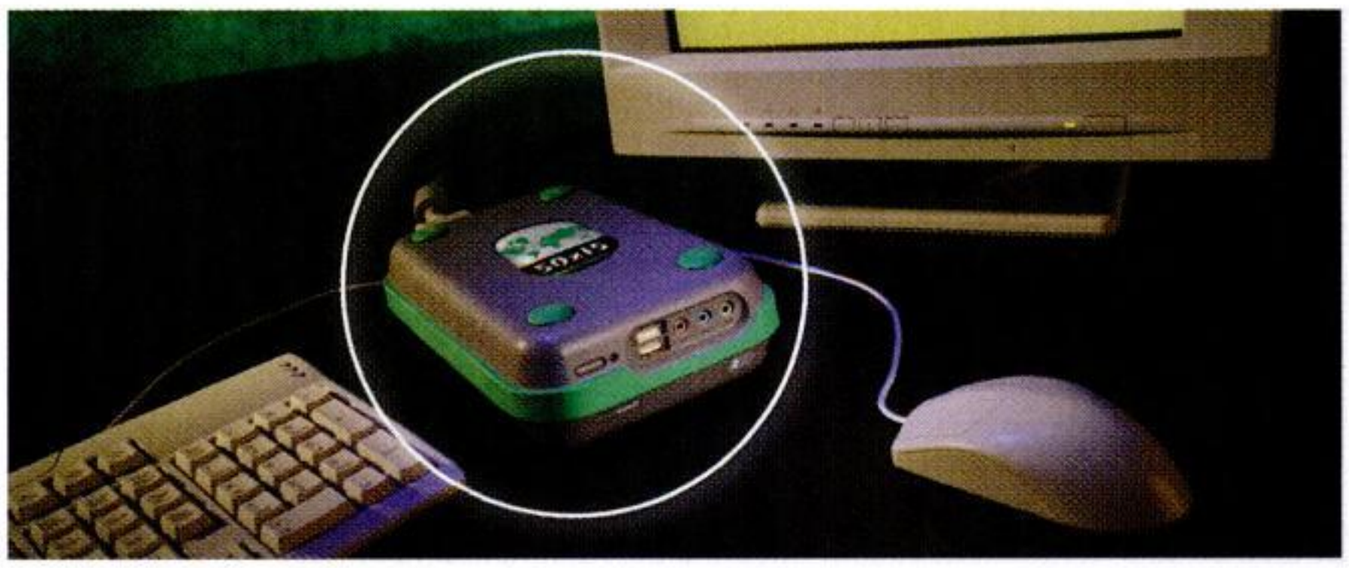
Sources have told *Maximum PC* that the initial version of nForce4 for the P4 will support a 1066MHz FSB, DDR2 667, and come in only LGA-775 implementations. And despite conflicting information about SoundStorm audio, all indications are that PC audio is dead as far as nVidia is concerned.

AMD Shows off Minimum PC

Chipmaker hopes to introduce rest of world to Internet

AMD is preparing to unleash a bare-bones, affordable PC in the hopes of giving more folks access to the Information Super Highway. Dubbed the Personal Internet Communicator, or PIC, the rectangular unit weighs a mere 4 pounds and is about the size of a box of Kleenex. It's powered by an AMD Geode GX processor running at 366MHz and includes 128MB of DDR memory, four USB ports, a 10GB hard drive, 56k modem, and basic soundcard. The PIC will cost $185 with a keyboard and mouse, or $249 with a 15-inch monitor. It runs a special version of Windows CE that includes features of Windows XP, along with the typical Microsoft OS applications.

The PIC is part of a campaign by AMD called "50x15"—the goal being to connect 50 percent of the world to the Internet by 2015. AMD plans to begin selling PICs in India, Russia, China, Mexico, and Brazil this year.



Perhaps AMD stole the idea for its PIC from our annual Lean Machine feature?

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TechnoFile

Quick takes on technology trends

Iwill ZMAX dp

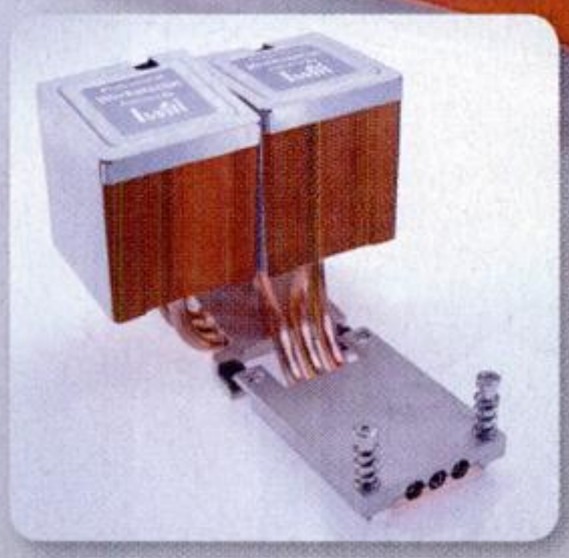
If you're wondering what a standard-looking small formfactor rig is doing basking in the glow of the Technofile limelight, rest assured there's nothing "standard" about this miniature monster.

Beneath the shiny fire-engine red exterior lies not one, but two Opteron CPUs, making this the first dual-CPU SFF rig the Maximum PC Lab has ever seen.

Common sense dictates that the words "dual-CPU" and "small formfactor" should never appear in the same sentence, but Iwill has made an end run around thermal issues by equipping both CPUs with massive, three-pipe copper heatsinks. Other tasty morsels include external SATA hookups, six USB 2.0 ports, onboard everything, and an cool-looking removable dorsal fin that doubles as a Wi-Fi antenna. Look for a full review of this baby behemoth in the near future. ■

The 300W power supply sports two little fans that lie flush with the CPU heatsinks, sucking hot air from their copper innards and sending it on its way.

The unit's backside is a connector smorgasbord with external SATA, four USB 2.0 ports, 10/100 Ethernet, 5.1 audio, AGP and PCI slots, and PS/2 ports.

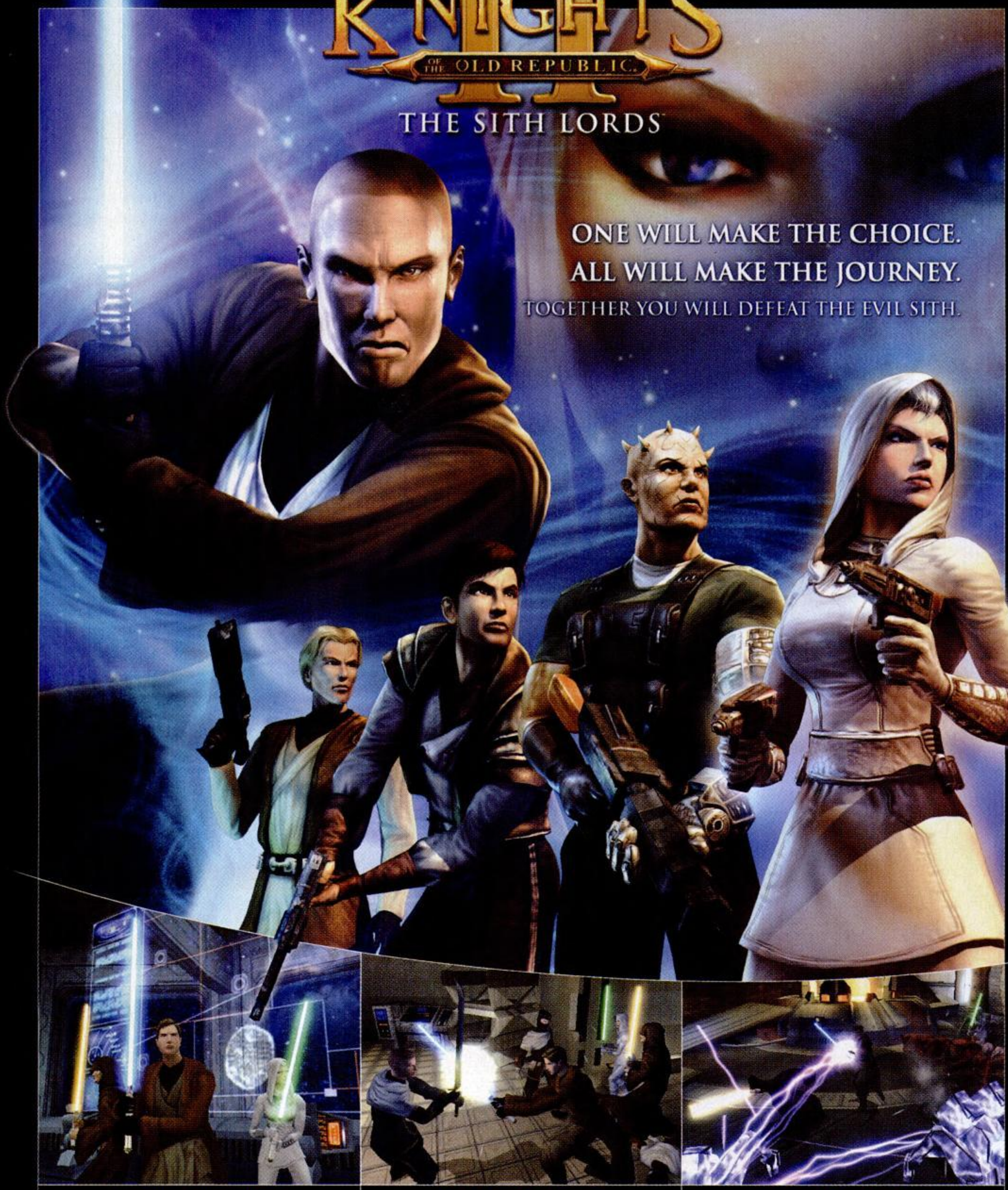


These bulging copper heatsinks utilize a three-pipe design to keep both Operton CPUs running cool and quiet.

STAR WARS KNIGHTS OF THE OLD REPUBLIC II

THE SITH LORDS

ONE WILL MAKE THE CHOICE.
ALL WILL MAKE THE JOURNEY.
TOGETHER YOU WILL DEFEAT THE EVIL SITH.



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Travel among 7 worlds and explore new environments on your mission to save the galaxy.

Wield over 60 new feats and Force powers as you and your party struggle to defeat the evil Sith.

TEEN T CONTENT RATED BY ESRB
Blood
Violence

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STAR WARS KNIGHTS OF THE OLD REPUBLIC II

THE SITH LORDS

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ALL WILL MAKE THE JOURNEY.
TOGETHER YOU WILL DESTROY THE JEDI ORDER.

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The Sequel to the 2003 GAME of the YEAR
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Your companions will follow you to the dark side of the Force based on your choices.

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Wield over 60 new feats and Force powers as you and your party hunt the last remnants of the Jedi Order.

THIS TIME, YOUR CHOICES AFFECT EVERYONE AROUND YOU.

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Head2Head

A showdown among natural competitors

THIS MONTH: Online Photo Services

You've got the killer digital camera and you've taken the incriminating bachelor party photos, but when you try to e-mail them to your buddies, their mail servers choke on your 3MB files. Sure, you could fire up *Photoshop*, resize the hell out of the images, and then hack some HTML to post the pics on a web site, but then your friends would have to burn a disc, and trudge down to the Fotomat every time they wanted a print.

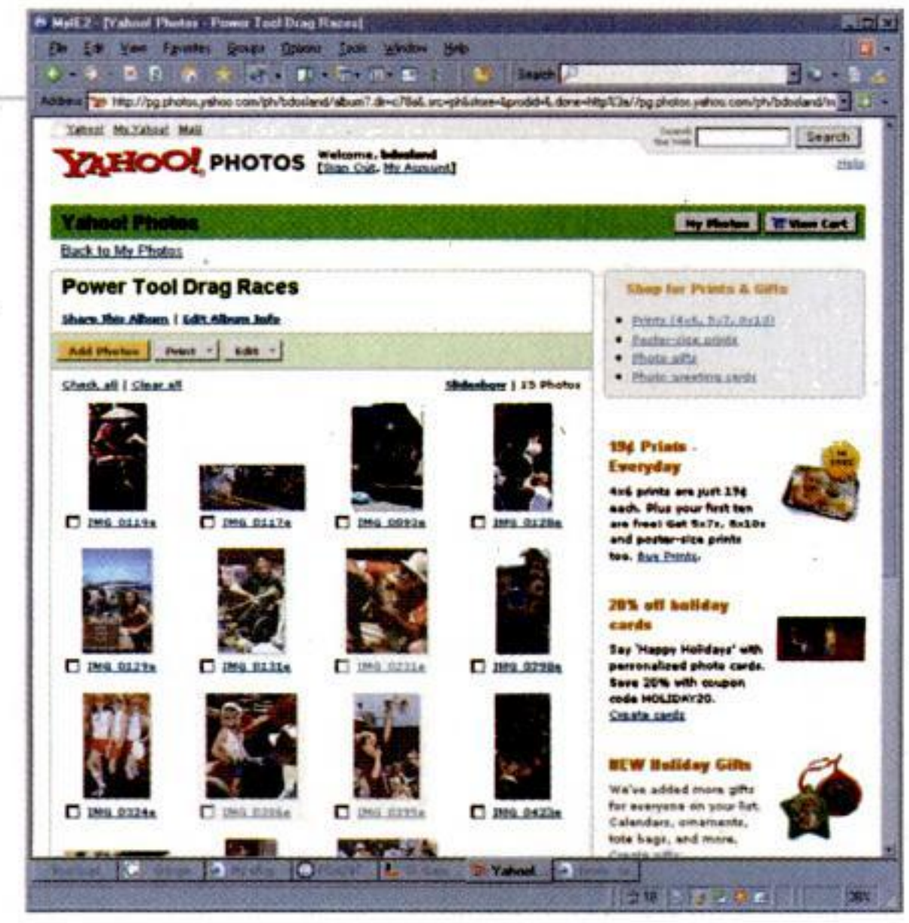
The solution is simple: online photo services. These web sites automagically create online galleries of your high-res pics, which your friends (and victims) can peruse at their leisure. Once they've chosen their favorite shots, they can buy paper prints directly online. These services (often free) are packed with near-limitless storage, offer fast-loading thumbnails, and sometimes include whistles and bells, such as rudimentary image editing. Let's take a look at the current field of competitors.

—BRAD DOSLAND

YAHOO!

Online experience: Suffers the worst web interface in this roundup: It's crowded with ads pimping sundry Yahoo! services, and image uploads are the slowest of the bunch (with progress feedback that's cryptic at best). Even guests viewing your gallery will be harassed with advertising.

Prints: Despite being the least expensive, Yahoo! prints are middle-of-the-pack in a very tight race. Colors are accurate and details are sharp, but some highlights are blown out.



Cost: With no service charge and the cheapest prints across-the-board, Yahoo! walks away with the best-value crown. Shipping charges add some tarnish, as Yahoo!'s are at the higher end of the spectrum.

Extras: In addition to offering mugs, mouse pads, coasters, calendars, aprons, and ornaments bearing your photos, Yahoo!'s service features an integrated link to the incredibly robust My Yahoo! service.

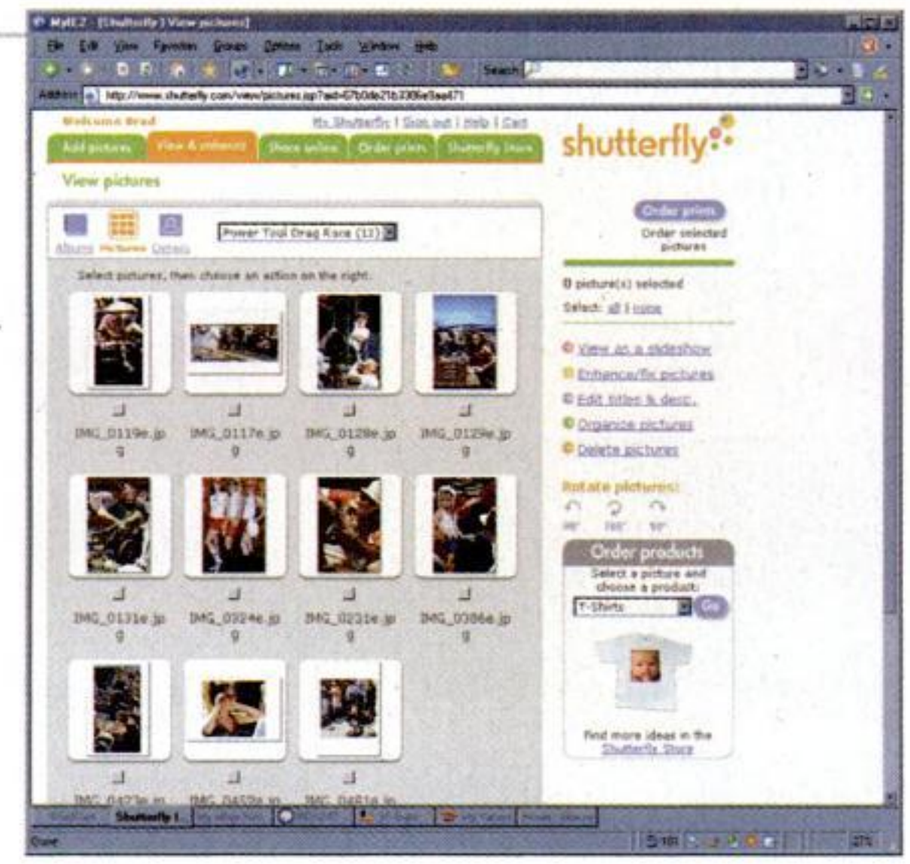
MAXIMUM PC VERDICT 8

http://photos.yahoo.com

SHUTTERFLY

Online experience: Site access was spotty; at various times the service was simply unavailable. Once accessed, the actual site looks similar to Snapfish—nondescript.

Prints: The gap between the best and worst prints in this roundup was not dramatic, but Shutterfly's output trailed the pack. Color was accurate, but sometimes dark areas were so dense that all detail was swallowed up.



Cost: In addition to being the worst looking, Shutterfly's prints are also the most expensive. For example, Shutterfly's weak 8x10s are *four* times more pricey than Ofoto's excellent $1 8x10s.

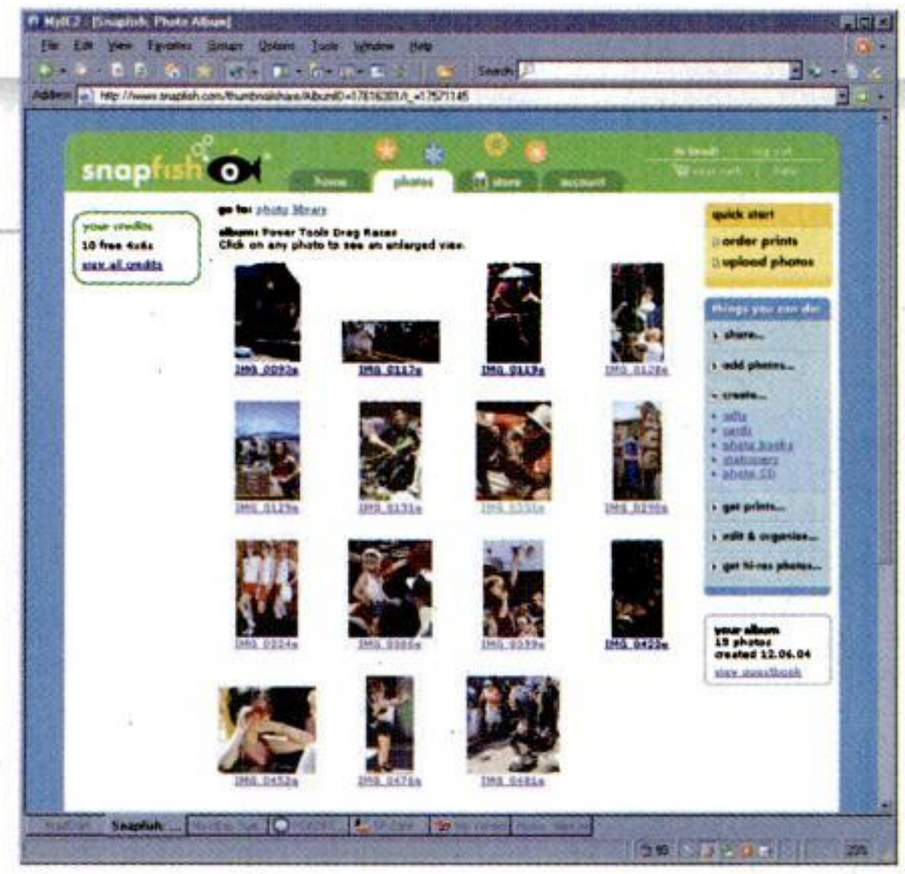
Extras: In addition to the standard array of mugs and such, Shutterfly offers framed prints (a great convenience) as well as archive CDs of images (although DVDs, which Smugmug offers, are preferable).

MAXIMUM PC VERDICT 5

www.shutterfly.com

Copyrighted material

SNAPFISH



Online experience: Interface is gunked up with nearly as many ads as Yahoo!, and invited guests must register before viewing galleries. Otherwise, the site is generic in function and appearance.

Prints: Snapfish gave Shutterfly the biggest competition for worst print quality with images that had a distinct green cast. The rule of thumb with printing is to err toward the more flattering red tones, but Snapfish went the other way.

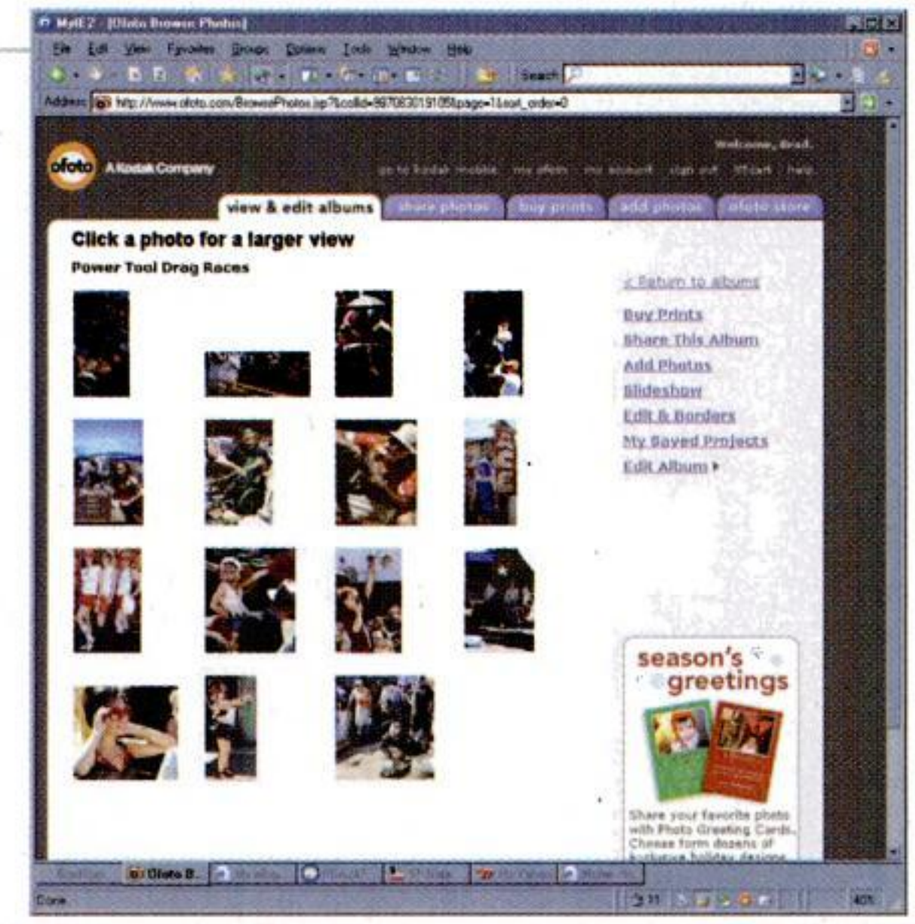
Cost: Basic service is free, but prints are among the most expensive. This is somewhat offset by the least-expensive shipping rates by far (half the cost of Yahoo's $2 first-class rate, and $6 less than Yahoo's $15 overnight rate).

Extras: Once again, mugs and cards with your pictures on them are available—as are custom ties! PhotoCDs are offered for archival use, and Snapfish's *PhotoShow Express* desktop software is available as a free download.

MAXIMUM PC VERDICT **5**

www.snapfish.com

OFOTO



Online experience: Ofoto features a clean interface with a bare minimum of ads. Ordering prints is a snap. Best of all, visitors are not required to register in order to view galleries.

Prints: You'd expect a service run by Kodak to produce impressive prints, and you'd be right. With bright, accurate colors, Ofoto's prints come in a close second only to Smugmug's.

Cost: The service is free with unlimited storage, but the prints are a mixed bag, price-wise. The prints themselves are the least expensive, but shipping is the most expensive, which equals out in the end.

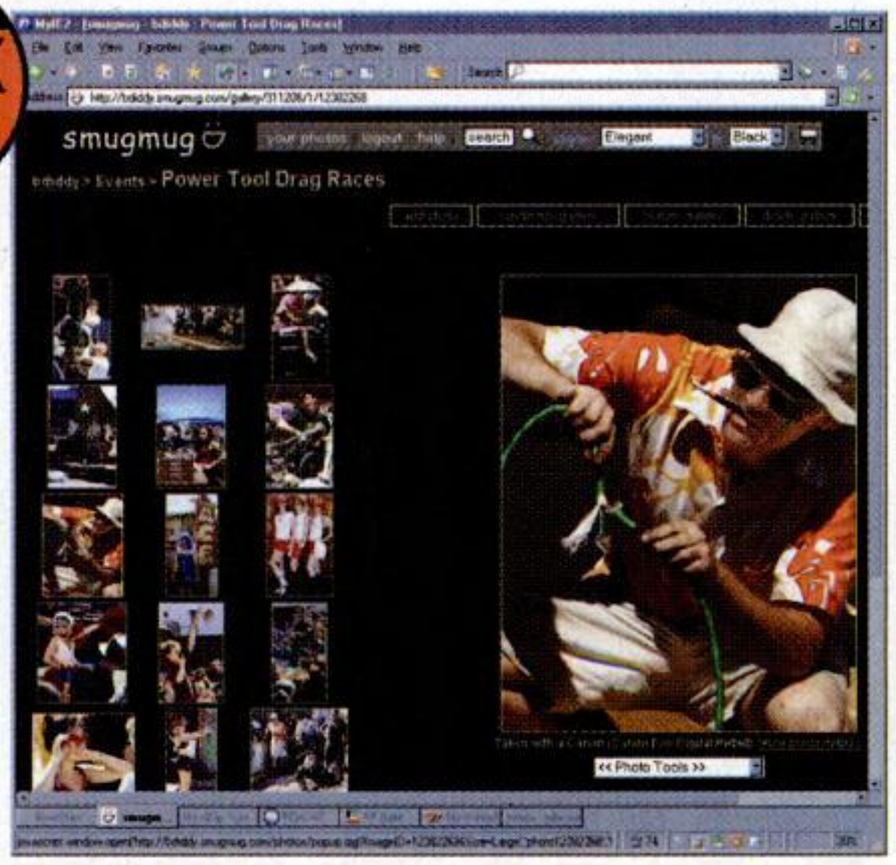
Extras: With a nationwide network of local printers, Ofoto is far and away the fastest online print service around. In our tests, Ofoto beat the competition by three days on so-called "Overnight" delivery (the others fail to make clear that their printing process takes a few days).

MAXIMUM PC VERDICT **8**

www.ofoto.com

SMUGMUG

MAXIMUM PC KICK ASS PRODUCT



Online experience: Far and away the best interface—clean and uncluttered by the hordes of ads that plague the other services' sites. In fact, Smugmug is as pristine as a hand-coded gallery page. Stepping up to the Power User ($44.95) or Pro ($99.95) packages allows you to completely customize the interface.

Prints: The race for best prints was a runoff between Kodak's Ofoto service and Smugmug, but we give Smugmug the nod for better color saturation and detail.

Cost: At $29.95 annually, Smugmug is the only pay service in this roundup, but you get what you pay for. In this case, you're paying for the best online interface, the best sharing format, and the best print quality.

Extras: With visitor commentary areas, photographer bios, and referral rewards, Smugmug delivers the goods that count (as opposed to kitsch such as mugs with your pictures on 'em). Plus you can order backup discs on DVD.

MAXIMUM PC VERDICT **9**

www.smugmug.com

THE UPSHOT

There's no such thing as a free lunch, and there's no such thing as a perfect free online photo service, especially when you have to choke down a wad of obnoxious ads. Smugmug may sport a price tag, but you'll be grateful every time you access the buttery-smooth service. And with room to grow your hobby into a professional business with just a few mouse clicks, **Smugmug** walks away with the other guys' lunch. If we were cheapskates, we'd go with Kodak's **Ofoto**—but we wouldn't feel as good about it.

Category Winners	
Online experience	Smugmug
Print quality	Smugmug
Cost	Yahoo!
Extras	Ofoto

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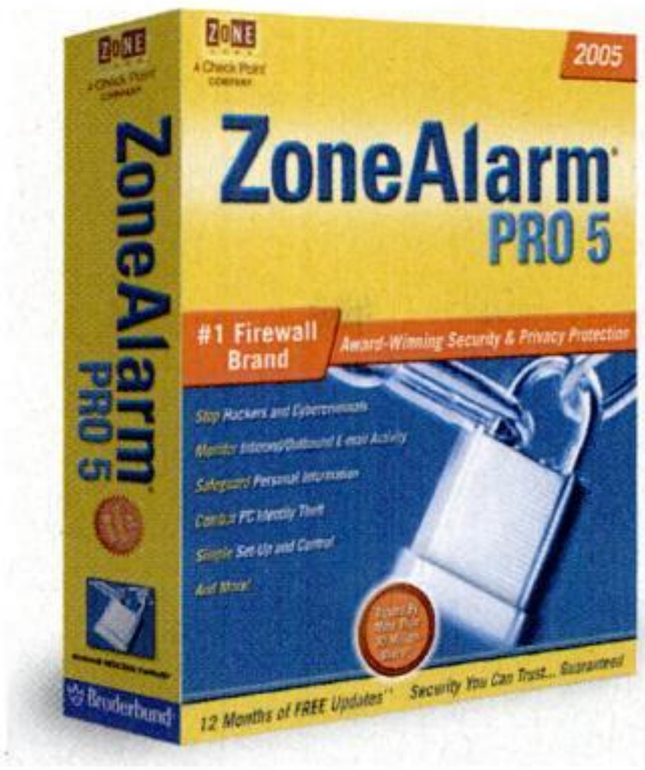
versions do it. You can set up your own computers to test this. I'm using a WRT54GS router with HyperWRT firmware and WallWatcher. *ZA*'s Gurus and Team Z members can provide no satisfactory answer. If you can get to the bottom of this, *ZA* users everywhere will be grateful. What's the purpose of having a firewall that won't block access to IPs you don't want contact with? Sheesh!

—ROBERT SELL



Zone Labs' *ZoneAlarm* doesn't appear to be spying, it's just difficult to turn off some features.

THE DOG RESPONDS: The Dog contacted Zone Labs and asked whether *ZoneAlarm* was spying on people, or if this is just a conspiracy theory from Area 53 (just down the street from Area 51)? The short official answer from Zone Labs is, "No way." Most of the information the program sends relates to updates, antivirus queries, and anonymous usage statistics. The Dog doesn't believe Zone Labs would try to spy on users, but it could certainly be more explicit about how users can disable all contact with ZoneLabs.com. Fortunately, the Dog was able to get information firsthand from the company that should make the reasons for the automatic contact more clear and the process for disabling it easier:

"You can turn off every feature that would make *ZoneAlarm* communicate back to a Zone Labs server. For your readers who want to understand how to do this, a list of steps follows as well as explanations of the risks involved.

"Basically, if someone turns off these features, the only way the software would communicate with Zone Labs is if the user does so manually. Hopefully, they would do so often enough to get their security updates. That's the risk of relying on manual communications—you may miss an update or get it late.

"The *ZoneAlarm* family of products offers a number of features and services that enhance your security by providing specific information about threats, configurations, and programs. To enable these services, *ZoneAlarm* security products communicate periodically with Zone Labs' servers. Of course, this communication is done on an 'opt in' basis; it's your choice whether to take advantage of these features and services.

"Here are the steps to take to disable any contact between your *ZoneAlarm* product and Zone Labs' servers. Note: Disabling these features will limit the functionality of the security product, in the ways described below.

"Turn off Antivirus Monitoring found in *ZoneAlarm*, *ZoneAlarm with Antivirus*, *ZoneAlarm Pro*, and *ZoneAlarm Security Suite*. Choose Antivirus Monitoring (or Antivirus) and set Monitoring to Off. Disabling this feature will prevent the program from informing you when your antivirus solution from vendors like Norton, McAfee, Trend, or CA is out of date or disabled.

"Turn off automatic updates to Antivirus Protection, found in *ZoneAlarm with Antivirus*, *ZoneAlarm Security Suite*. Choose Antivirus > Main, and click the Antivirus Options button. The Advanced Antivirus Settings dialog appears. Select Updates from the list on the left, and uncheck 'Disable Automatic Updates.' Disabling this feature prevents your *ZoneAlarm* product from automatically updating its antivirus definitions, radically reducing its effectiveness against new viruses.

"Disable Program Advisor (security advice from the AlertAdvisor) found in *ZoneAlarm Pro* and *ZoneAlarm Security Suite*. Choose Program Control > Main and set the AlertAdvisor slider to Off. This feature can normally be run in automatic or manual mode. If you shut it off entirely, you won't have program access permissions assigned automatically, and you won't receive recommendations in manual mode. You will instead be asked to manually confirm (without advice) whether each new program, when launched, can access the Internet.

"Disable sharing your security settings, found in *ZoneAlarm Pro* and *ZoneAlarm Security Suite*. Choose Overview > Preferences, and uncheck 'Share my security settings anonymously with Zone Labs.' With this feature disabled, you won't be sharing your configuration information with Zone Labs. Zone Labs aggregates and analyzes this anonymous information to improve performance of its products.

"Disable automatic Check for Update functionality, found in *ZoneAlarm Pro* and *ZoneAlarm Security Suite*. Choose Overview > Preferences, and set the Check for Updates button to Manual. With this feature disabled, you won't be automatically notified when Zone Labs releases a new version of its products. You should make sure you continue to click the manual 'Check for Update' button every few weeks, so you don't miss a product update." ■

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

Events and Promotions

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The 1st Extra will arrive in March 2005!

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WINDOWS XP THE RIGHT WAY

Lab-tested and *Maximum PC*-approved, the ultimate four-point plan for eternal Windows bliss.

You may have grown up in Mayberry, where everyday life was simple; where nobody locked any doors and good Samaritans returned your wallet with the contents intact. But when you moved to the big city, life got a lot more complicated. You had to figure out all of life's cruel angles, and eventually you learned that your apartment needed not only locks, but also an alarm system, and a snarling Rottweiler to keep watch. You learned to look over your shoulder and avoid dark alleys, and at some point you may even have considered some form of non-lethal self-defense.

And so it is with today's PCs. There are more obtuse configuration options in Windows XP than there were in Win95, Win98, and Win2000, and each option can have a profound effect on how efficiently your rig operates. And once you're online, your PC will be under constant attack from a rogue's gallery of virtual threats, including virus infections, Trojans, and worms. Such are the twin Achilles' heels of WinXP: Because it's so damned popular, it's become an irresistible attraction to the ne'er-do-wells who write spyware, and because it's so damned complicated, the world's wretched code monkeys have ample opportunity for exploitation.

The upshot is that preventive measures have become absolutely essential to every Windows PC user. After you do an initial operating system overhaul, you need to practice continued vigilance to protect yourself against malware, frivolous utilities, and poorly coded apps that steal resources and time.

In this step-by-step guide, we'll show you how to flush your PC of all the crud—including performing a clean installation if necessary—and how to keep it tuned to perfection until Windows Longhorn arrives. In fact, this may be the last Windows XP guide you'll ever need before it's time to switch to the next-generation OS.

ATTENTION!

As with all *Maximum PC* how-to articles, make sure you read the entire article before proceeding with the actual project.

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ILLUSTRATION BY GIACOMO MARCHESI

Installing WinXP—the Right Way

Proper overhaul procedures for PCs exhibiting an almost Mickey Rourke-level of petulance and bugginess

In the bad-old days, when we were all stuck using Win9x-based operating systems, reinstalling Windows was an annual chore. Windows XP changed that. With WinXP, reformatting has become a blessedly rare occurrence, usually occasioned by a big hardware upgrade. However, over the last 18 months, we've seen an alarming increase in all forms of "malware"—from traditional viruses and worms to new-age spyware and trojans. And frequently, the *only* way to remove the infection is to raze Windows and start over.

In the case of malware, the old proverb "an ounce of prevention is worth a pound of cure" holds true; it's infinitely easier to prevent infections on your computer than to deal with the mess they leave behind. In this section, we're going to show you how to install Windows from scratch and protect it while it's at its most vulnerable, and teach you how to avoid trouble so you won't become infected down the line.

Needless to say, starting with a fresh install of Windows is a drastic step. If your machine hasn't exhibited any of the common signs of spyware infection (check the 6 Signs sidebar on this page), then you might not need to wipe your current WinXP install just yet. Instead, skip ahead to our preventive medicine advice on page 34.

If, on the other hand, your machine is more infected than a pack of runny-nosed first graders, keep reading.

FIRST, DO A BACKUP

The safest and easiest way to cleanly install Windows is to put it on a newly purchased, virgin hard drive (see hardware installation instructions on the next page). Then, after you've patched this fresh WinXP installation with Microsoft's latest updates, and installed antivirus and anti-spyware apps, you can safely copy your treasured personal documents from your original (and possibly infected) hard drive to the new drive. New drives cost as little as $1 per gigabyte, so we recommend the buy-a-new-drive approach. However, if you decide to reformat your current drive, and then install WinXP on it, you'll need to back up all your important data and documents, including (but not limited to) the following:

WARNING!
Reinstalling Windows will wipe all data from the operating system partition, so back up all your precious data and documents!

- E-mail
- Personal files
- Bookmarks
- Software serial numbers
- MP3, AVI, and other media files
- Saved games
- Billet-doux

Seems easier to simply shell out for a new drive than to back up all that stuff, doesn't it? Once you've purchased your new hard drive, you'll need to collect a few key ingredients. We've put a handy-dandy checklist of all the stuff you'll need in the sidebar to the left. Of special note is Windows XP Service Pack 2, which should be downloaded from **www.microsoft.com/downloads** before you start your basic OS installation. Why do this beforehand? Because if you connect an unpatched, unfirewalled computer to the Internet long enough to download the latest Microsoft updates, your machine *will* be infected

INSTALLING WINDOWS XP

Whether you're new to WinXP or install it thrice a week just for kicks, we want to impress upon you a few *Maximum PC*-certified tips that should make your installation easier. First, you should unplug your network cable during this phase of the project because WinXP is at its most vulnerable right after it's installed (before your firewall is online and any patches are applied).

Second, shut down the PC, install your new hard drive, disconnect your old drive, and reboot the machine. (If you're installing Windows on a Serial ATA hard drive or any kind of RAID array, this is a good time to make sure you have a working floppy drive connected to your system. You'll need a floppy drive to install the drivers that will let Windows see your hard drive.) Third, it's a good idea to disconnect any USB or FireWire drives you might have (even memory card readers should be disconnected). These drives can confuse the WinXP installer, and might prevent you from installing the OS on the drive letter you prefer.

After following the above tips, put your WinXP CD in your optical drive, and reboot the machine. After the BIOS screen pops up, you should see a prompt that says "Press any key to boot from CD...." Now press a key and the Windows installer will start. If you don't see the prompt to boot from the CD, you need to ensure that your optical drive is listed before your hard drive in your BIOS's boot order. Consult your mobo manual for the full scoop on adjusting your boot order. If you're installing drivers for your RAID or SATA

6 SIGNS YOUR MACHINE IS INFECTED

- You're deluged with pop-up ads.
- Your web browser defaults to a page you never requested, as if possessed by a demon.
- Media files open in strange applications.
- Your machine takes a long time to do anything—boot, open apps, shut down, etc).
- You suffer frequent, unexplainable slowdowns.
- Your computer just starts acting plain whacked!

THINGS YOU'LL NEED BEFORE INSTALLING WINXP

- A blank hard drive (duh)
- Windows XP CD (uh, *yeah*)
- WinXP Service Pack 2
- Drivers for your all your hardware
- A floppy drive (if you want to install on a RAID array or Serial ATA drive)
- Any info you'll need to connect to the Internet (e.g., PPPoE login or static IP address)
- Firewall software (we like the free version of *ZoneAlarm*)

Once you've collected everything in this list, you can get started installing Windows.

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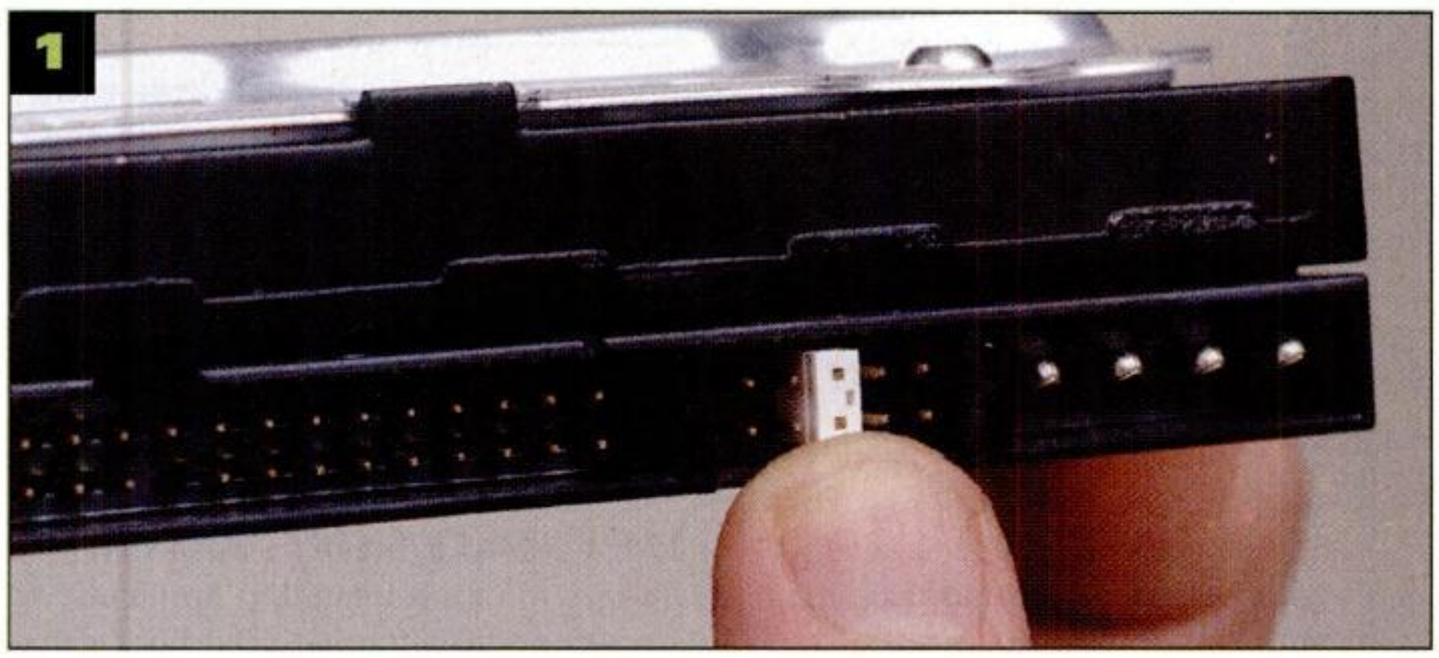
drives, watch the bottom of the screen immediately after it turns blue for the "Press F6 to install a third-party SCSI or RAID driver..." prompt. Pressing F6 has no immediate effect, but it will give you the option to load drivers at the appropriate time.

From this point on, the Windows installer should guide you through the install process.

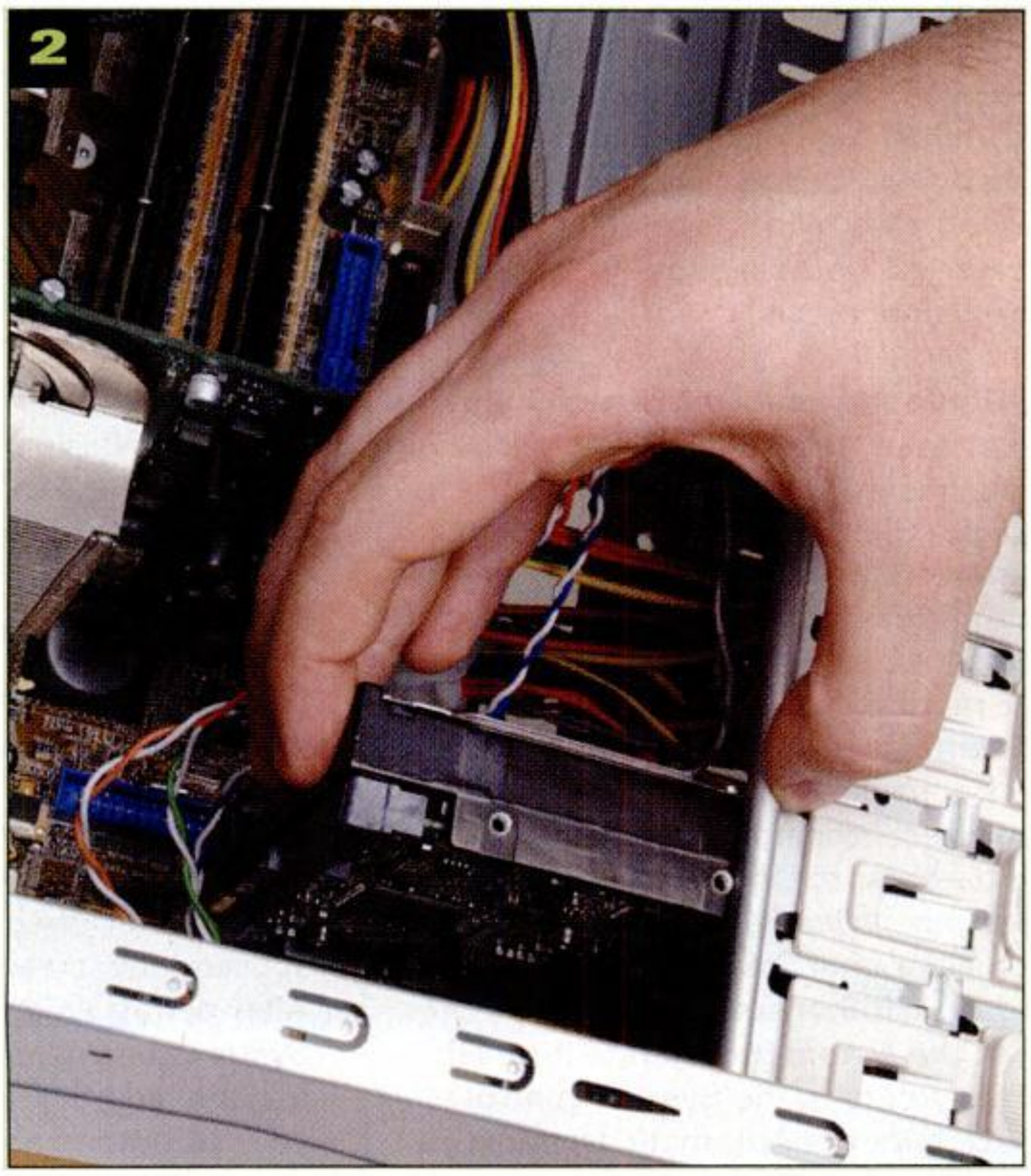
Install a hard drive in 3 easy steps

Installing a new hard drive is as easy as opening your case, setting your drive's jumpers, and plugging in a couple of cables. But before you install a new hard drive—and disconnect the old one—make sure you've collected all the data and downloaded all the drivers you'll need for the rest of this how-to project.



STEP 1: Prep the drive. Every parallel ATA drive sports a physical "jumper" plug that controls the drive's master/slave status (there can be only one master and one slave device on each parallel ATA channel). We recommend you set your new drive to the master setting and your old drive to the slave setting. (SATA drives don't have master and slave settings, so SATA owners can ignore this step.)

STEP 2: Install the drive. Find an empty 3.5-inch drive bay (typically near the front of the case at the bottom), and slide the drive into the bay. Make sure the cable connectors are where you can get at them. Mount the drive in place with four screws or your case's brackets.



STEP 3: Get connected. Now attach the parallel ATA cable from your motherboard to the new hard drive, and attach the power cable from your power supply to your drive. Until you're ready to copy your personal documents from your old drive to your new drive, you should leave the old hard drive disconnected so you can't accidentally wipe it.

WINXP DOs & DON'Ts

DON'T be afraid to reinstall Windows! It's not hard, especially if you install onto a blank hard drive instead of wiping your existing drive.

DO install your F6 SATA drivers instead of the ones built into Windows. You won't be able to take advantage of advanced features without them.

DO use a slipstreamed Windows XP install disc with the latest Service Pack built in. (Check www.maximumpc.com/how-to/howtoindex.html for full details on creating your own slipstreamed WinXP install disc.)

DO collect drivers for all of your software and burn them to CD or DVD before you format your hard drive.

DO disconnect your old hard drive before you install Windows. You don't want to accidentally erase all your files!

DON'T copy data or files from your old hard drive until your new machine is protected.

DON'T waste a bunch of time trying to repair a hopelessly infected Windows install. It can take more time to clean off the infected files than to back up your data and reinstall Windows.

DON'T connect your computer to the Internet until you have a firewall installed and configured.

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Configuring Windows—the Right Way

It's sort of like sending your operating system to military school before the counterculture can corrupt its mind

After Windows XP finishes installing itself, it's crucial you begin protecting your system posthaste—i.e., *before* you put your PC online, where, inevitably, it will be exposed to corrupting influences. This means you'll need to postpone activating Windows until after you've installed Service Pack 2 and activated the firewall—unless you want to go through the hassle of activating Windows XP over the phone.

If you have a copy of Service Pack 2 saved someplace—on a USB thumb drive or a CD-ROM—it's easy to install. Just click the executable file, and follow the instructions at the prompt. Service Pack 2 enables WinXP's firewall from the get-go. Once the firewall is installed and enabled, you can reconnect your machine to the network and activate Windows.

Now, it's time to get down to the business of installing drivers. When you install new drivers, Windows will frequently prompt you to reboot your system. It's absolutely vital you reboot your computer when an install program tells you to. If you don't, misfortune is sure to follow.

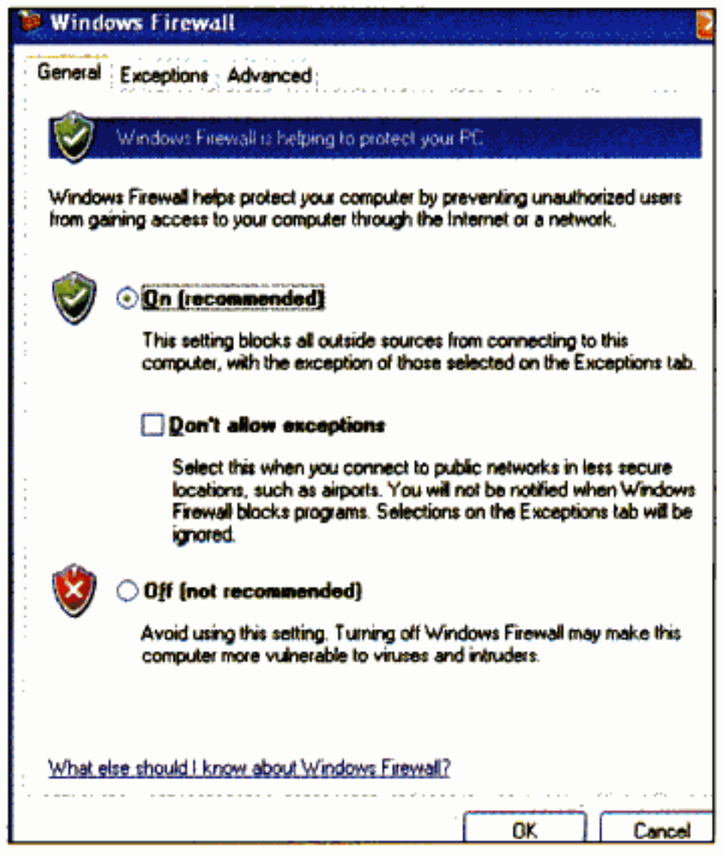
We recommend installing the latest chipset drivers from your mobo manufacturer's web site first. These drivers control things like your hard drive controller and videocard interface. Running the latest drivers will greatly increase the stability of your system! Reboot when prompted.

After installing the motherboard chipset drivers, install the latest version of DirectX (assuming there's a newer version of DirectX than the one included in Service Pack 2). The newest version of DirectX will always be in the Optional Components list at **www.windowsupdate.com.** Next, we recommend you run the latest reference driver for your videocard, which will be available at **www.ati.com** or **www.nvidia.com.**

Finally, install the drivers for any other devices connected to your PC, reconnect all your USB devices, and take your system for a test spin to make sure it's working as expected.

IT ONLY TAKES 4 MINUTES

This may be hard to believe, but testing has shown it takes only four minutes for a clean install of Windows XP exposed to the Internet to be infected by self-propagating worms! That's why you shouldn't connect your PC to the net without a firewall!

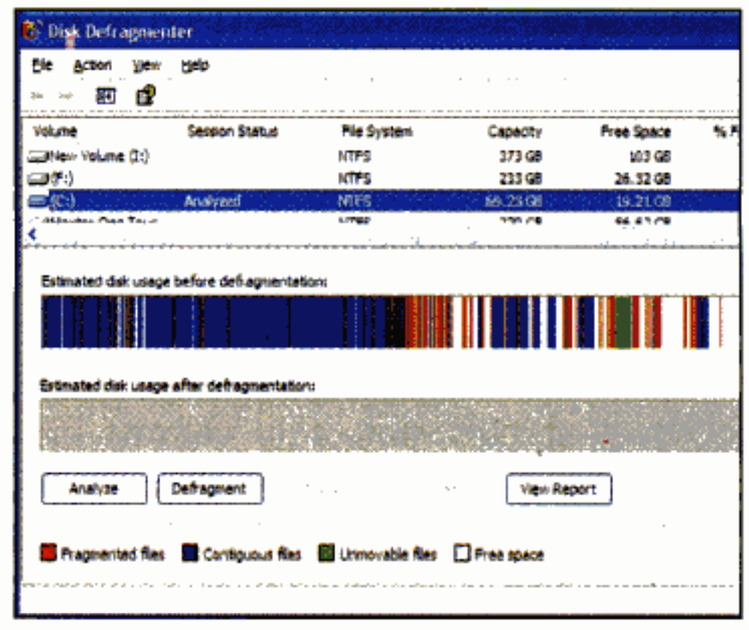

Windows Firewall
General
Exceptions
Advanced
Windows Firewall is helping to protect your PC
Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
On (recommended)
This setting blocks all outside sources from connecting to this computer, with the exception of those selected on the Exceptions tab.
Don't allow exceptions
Select this when you connect to public networks in less secure locations, such as airports. You will not be notified when Windows Firewall blocks programs. Selections on the Exceptions tab will be ignored.
Off (not recommended)
Avoid using this setting. Turning off Windows Firewall may make this computer more vulnerable to viruses and intruders.
What else should I know about Windows Firewall?
OK
Cancel

The firewall built into Windows XP SP2 is sufficient to start. Make sure it's enabled by going to the Windows Firewall control panel.

TIDYING UP WINDOWS

Now that Windows is up and running, it's time to do a final housekeeping pass. First, you should download and install any remaining critical updates from **www.windowsupdate.com.** Next, you can turn off all of WinXP's annoying little "features." Here's a short list of Windows' worst antagonists.

- **Disable the annoying search helper:** Go to Start, then Search, and click "Turn off animated character."
- **Resize the Recycle Bin and System Restore:** Right-click the Recycle Bin and go to Properties. Move the slider from 10 percent—that's 40GB of a 400GB drive—to a more reasonable 1 percent. The System Restore setting is in the System control panel. Right-click My Computer and select Properties, or—shortcut alert!—press the Windows key and Pause/Break, then click System Restore. Move that slider until System Restore uses only about 600MB of space.
- **Set the Automatic Update interval:** While you're in the System control panel, click the Automatic Updates tab. If you're not going to remember to install updates fairly regularly, you *absolutely must* set Windows to automatically download and install updates for you every week.



It's a good idea to spend a little extra time and defragment the space used by the pagefile and System Restore.

DEFRAG LIKE MAD

Before you start installing applications, it's a good idea to give your hard drive a powerful defrag (in the Maximum PC Lab, we do this on our test beds before any critical tests). When Windows is running, the pagefile and the portions of the drive reserved for System Restore checkpoints cannot be defragged, so before defragging, we always disable both System Restore and the pagefile.

WARNING!
Windows will not work without the pagefile if you have less than 256MB of RAM. Do *not* disable the pagefile if you have less than 256MB of RAM!

To disable System Restore, open the System control panel (Windows key and Pause/Break) and click the System Restore tab. Now check "Turn off System Restore." To temporarily disable the pagefile, click the Advanced tab, and click the Settings button in the Performance section. Click the Advanced tab again, and then click Change. Click "No paging file," then keep pressing OK until you're back at the Desktop. Reboot your computer.

When you reboot, open up defrag by opening My Computer and right-clicking your C: drive. Go to Properties, then Tools, then Defragment Now, and on the subsequent screen, click Defragment. After defrag finishes, go back into the System control panel and re-enable the pagefile and System Restore. Reboot your computer, and it should purr quite nicely.

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It's only a matter of time before malicious threats infiltrate your computer. Don't wait until it happens.

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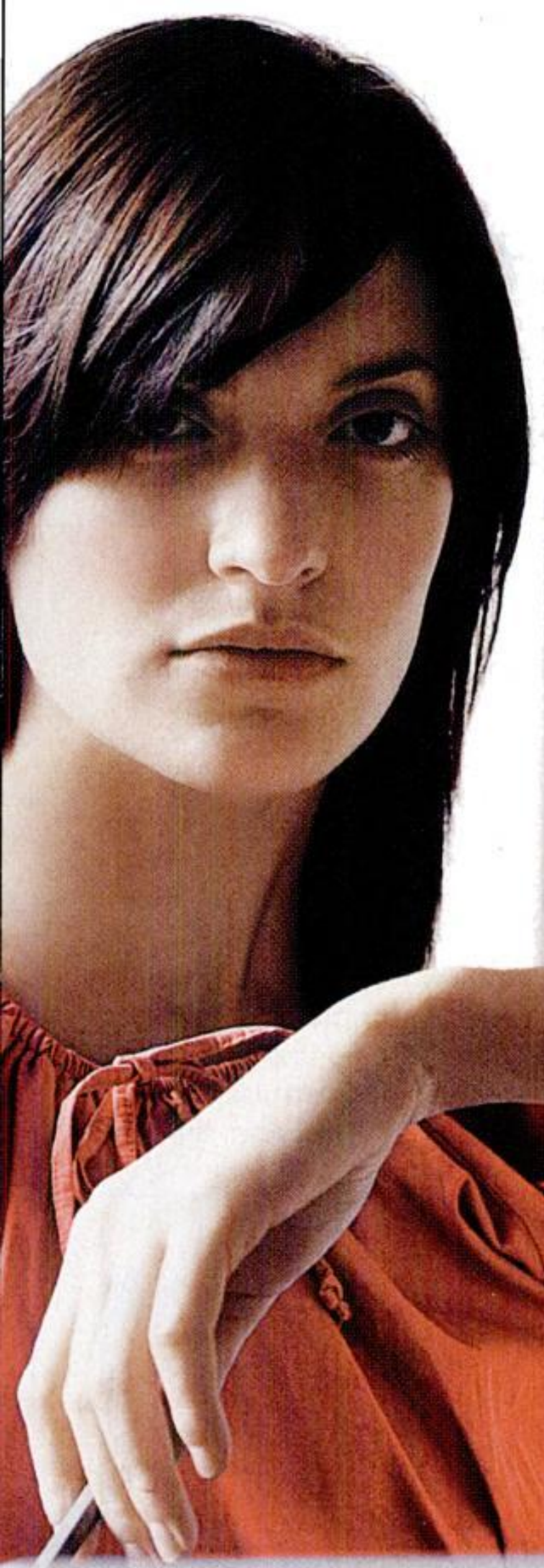
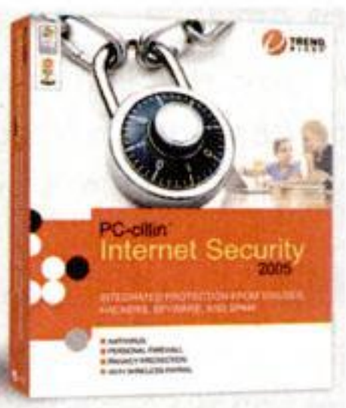


Recommended

World Class 2004 award, PC World
Editors' Choice, November 2004, CNET
Top 100 Products of 2004, Computer Shopper



BEST BUY COMPUSA Fry's ELECTRONICS

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WINXP DOs & DON'Ts

DO run weekly antivirus and anti-spyware scans. This cannot be emphasized enough.

DON'T forget the firewall. A firewall will protect even an unpatched system in the event a new, undocumented worm attacks.

DO set your antivirus software to scan every new download and every e-mail attachment.

DON'T assume your virus and spyware definitions are up to date. Check them frequently to make sure everything is in order.

DO run several anti-spyware apps regularly. No single anti-spyware app we tested detected all the spyware on our test system.

DON'T freak out if your firewall warns you your computer is being probed. Every computer on the Internet is regularly scanned by malicious programs.

DO ensure your firewall is working properly and your virus definitions are up to date before you connect your laptop to a foreign network. Public Wi-Fi networks are the Thai brothels of the PC world.

DON'T hide file extensions in Windows. Tricky viruses hide their real extensions behind an innocuous extension. For example, the file dirtyvirus.jpg.exe will look like dirtyvirus.jpg in many e-mail programs. Show file extensions by going to the Folder Options control panel, clicking the View tab, and ensuring that "Hide extensions for known file types" is unchecked.

Protect Your PC—the Right Way

You can't put your PC into a God mode of invulnerability, but you can load it to the hilt with defensive weaponry

No amount of protective software will keep spyware, viruses, and worms off of your PC if you don't practice safe computing. Likewise, if your computer isn't protected with a firewall and antivirus software, it *will be infected* no matter how careful you are. To stay safe, you need to make good decisions and have the right software installed.

PROPHYLACTIC APPS FOR INFECTION PREVENTION

Your firewall software is your first line of defense. It's the barrier between your computer and all the other computers it's networked with (either on a LAN or the Internet at large). Your antivirus software is your second line of defense. It will identify, isolate, torture, and then destroy any virus-infected files that find their way into your PC. Besides regularly scanning your hard drives for nogoodniks, a solid antivirus app will inspect all new files that are downloaded or created on your computer, and keep an eye peeled for virus-like activities.

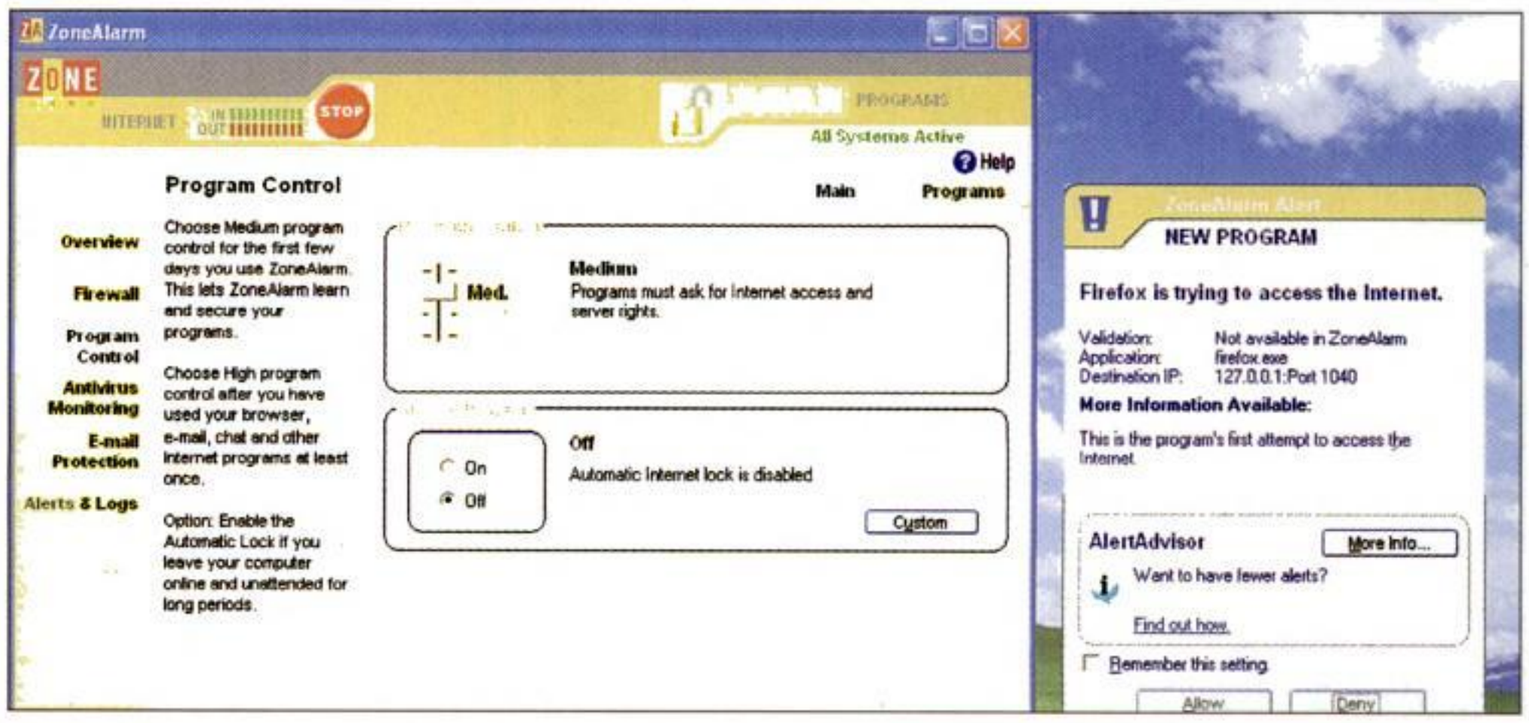
You'll also want to regularly scan your computer with several anti-spyware apps from different companies, as no single app seems to catch all the different varieties of spyware out there. Anti-spyware apps work much like antivirus apps: They scan your computer for known spyware programs, identify them for you, and help you give 'em the heave-ho.

Let's take a close look at different protection apps...

THE FIREWALL: COMPUTING'S FEROCIOUS ROTTWEILER

Until recently, firewall software was the exclusive purview of large corporate IT departments, not home users. That all changed when worms—which spread from Windows machine to Windows machine without user action—infected thousands of computers connected to the net. Worms exploit bugs in Windows (such as *Word* and *Outlook*), but they can't get to the software if a computer is running a properly configured firewall. They'll be stopped at the gate. And even in the unlikely event that a firewalled machine is infected, the firewall will at least prevent the worm from spreading further.

The firewall built into Service Pack 2 for Windows XP offers decent baseline protection, but the free version of *ZoneAlarm* (**www.zonelabs.com**) is just as easy to use, much more flexible, and it delivers more features. *ZoneAlarm* works on a per-application basis—when a program tries to connect to the Internet, the firewall asks you whether that app has permission to connect. Without your permission, the app



Firewall software, such as *ZoneAlarm*, serves as a gatekeeper. No applications on your PC can connect to the Internet, and no machines on the Internet can connect to your PC, unless you specifically grant them permission via your firewall.

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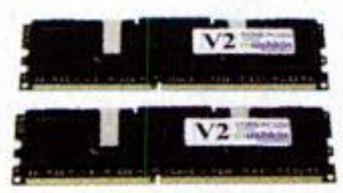

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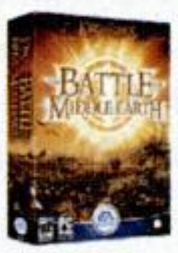

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WINXP DOs & DON'Ts

DO keep your software (including Windows) patched and up to date.

DO use safer programs like *Firefox* and *Thunderbird* instead of *Internet Explorer* and *Outlook Express*. Because these alternative, open-source programs are less popular and don't support inherently unsecure ActiveX controls, they're less vulnerable to attack.

DON'T leave ActiveX enabled for all web sites. Disable it by going to the Security tab of the Internet control panel, clicking Internet, then Custom Level, and selecting Disable for every object in the Active X section.

DO enable ActiveX *only* for the Windows Update site so you can download Windows updates. Go back to the Security tab of the Internet control panel, select Trusted Sites, then click Sites and add http://*.microsoft.com.

DON'T install apps from web sites you don't trust. Most spyware piggybacks on tiny downloads pretending to be utilities or applets necessary to view certain web sites.

DON'T click on e-mail attachments from strangers, or download software from pop-up ads. That free kitten screensaver or cursor collection might be tempting, but you're sure to catch web cooties if you take the bait.

DO stay away from peer-to-peer apps! Apps like *Kazaa* are chock-full of spyware! Free music isn't worth the price you pay in blood.

will be denied online access. *ZoneAlarm* also prevents other computers from even seeing that your PC is connected to the Internet, making your machine essentially invisible to bad guys. Most firewall developers issue infrequent software updates; maybe one a month. Nonetheless, you should always take advantage of these downloads when they're offered.

At this point, you might be wondering about the usefulness of the firewall built into your network router. The short story is that this firewall will protect your PC from external threats, but it won't do jack-diddly if a worm accidentally gets loose inside your local network. In fact, we've seen hardened corporate networks brought to their knees by a single infected laptop that was inadvertently connected to a wireless LAN. So, even if your router sports a firewall, it pays to install a software firewall on every computer on your network, *especially* laptops and other machines that frequently travel outside your home.

ANTIVIRUS SOFTWARE: YOUR PC'S IMMUNE SYSTEM

There are loads of good antivirus apps available, but for home users, we prefer Grisoft's free version of *AVG* (**www.grisoft.com**). It does everything we expect a good antivirus program to do, and it doesn't cost a penny. Regardless of which antivirus software you choose, you should run a complete scan of your computer at least once a week, and update your antivirus definition file (the list of known viruses your software will scan for) several times a week. After all, the real strength of good antivirus software doesn't lie in the client application—it lies in the software developer's ability to suss out new threats, and get them recognized in a definition file as soon as possible.

ANTI-SPYWARE SOFTWARE: KILLING GNATS AND NITS

Spyware is the downfall of many an innocent PC user. There's an almost infinite number of these damnable apps, which millions of innocent users have unwittingly installed, crippling their computers in the process. Most spyware is difficult, if not impossible, to remove using standard techniques. Instead, you must use a spyware removal tool or manually edit Registry and configuration files, and delete the detritus that spyware spews all over your hard drive—if you can locate all that crap in the first place.

Luckily for you, most spyware removal programs are either cheap or free. When used together, programs like *Spybot Search & Destroy* (**www.safer-networking.org**), *Ad-Aware SE Personal Edition* (**www.lavasoftusa.com**), and *Spy Sweeper* (**www.webroot.com**) are capable of determining the species of spyware that taints your computer, and removing it.

Unfortunately, the scumbags and pusbuckets who write spyware constantly modify their apps to make them more difficult to detect and remove. So, just like antivirus applications, anti-spyware programs depend on frequently updated definition files. We suggest you update your spyware definitions whenever you update your virus definitions, and scan your hard drives weekly to ensure that infections don't run unchecked.

MALWARE DEFINED

Malware is a catch-all term for any type of unwanted software that wages mischief on your computer. Here are some definitions of specific malware types.

- **Virus:** A small program that causes damage to a computer. Viruses usually require user action to spread and are transmitted through e-mail attachments disguised as "friendly" programs.
- **Worm:** A type of program that spreads across networks automatically. Unlike a garden-variety virus, a worm doesn't depend on the user for propagation.
- **Spyware:** A program that gathers your personal data (web-surfing habits, e-mail addresses, even passwords and credit card numbers), and then transmits the data to some evil home base.
- **Adware:** A program that displays web advertisements, often in annoying pop-up windows that are seemingly impossible to close.
- **Death by 1,000 rabid rat bites:** How we'd like to terminate the human refuse who create malware.

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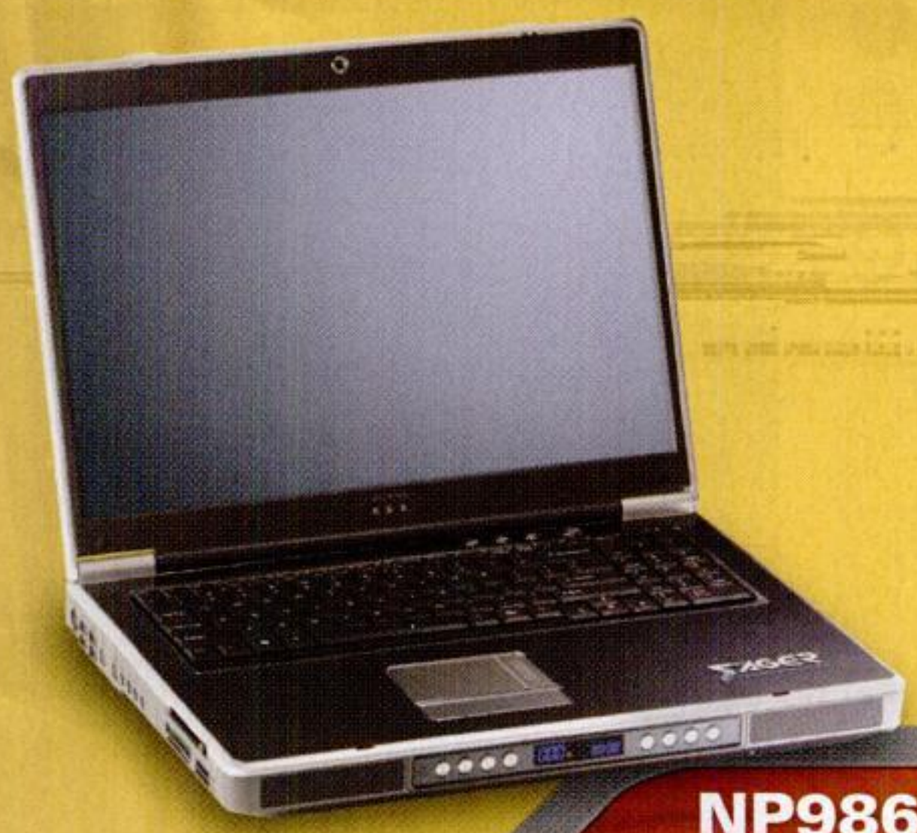

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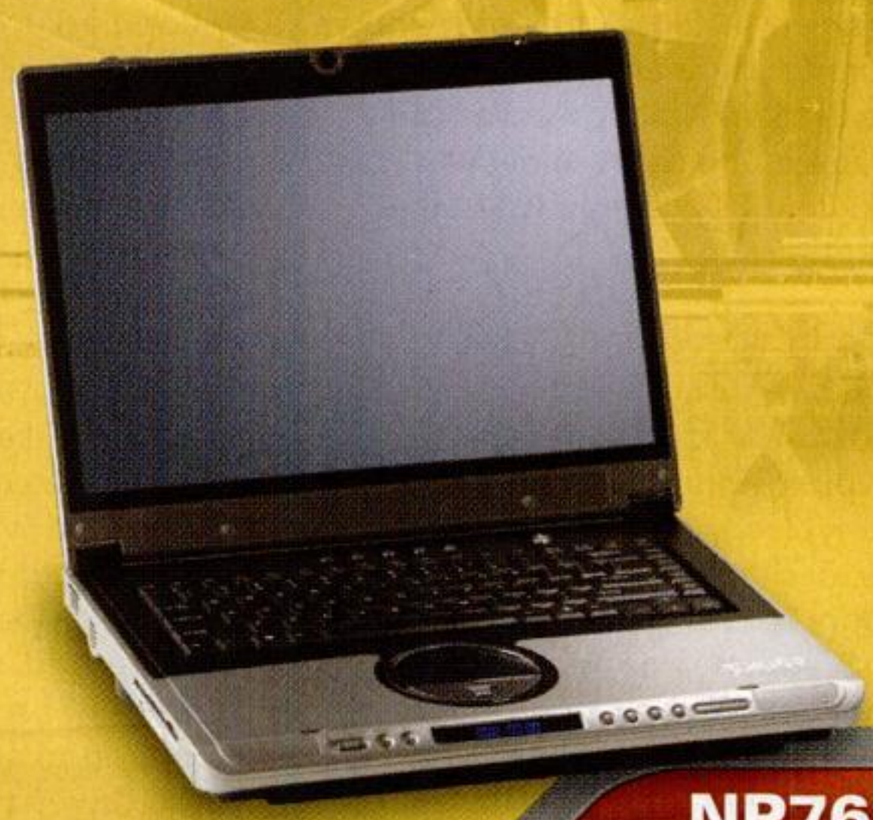

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Maintain Your PC—the Right Way

There's no shame in making backups. Go commando, and you'll wish you hadn't

Now that you've installed your OS and it's as fresh and minty as an Altoid, you'd be wise to develop a plan to keep it that way. With a little care and planning, you can keep your newly installed copy of Windows XP free from spyware and viruses, backed up and ready to reload in case disaster strikes. Follow along as we show you how to maintain your PC the right way—the *Maximum PC* way.

DEVELOP A DEFENSIVE PLAN

The data you lovingly place on your hard drive typically falls into several categories, each of varying importance. One category is the Windows installation itself, which you may or may not care too deeply about. The second category is your apps, games, and utilities, which are usually replaceable (though reinstallation is a PITA, we won't kid you). The third category we define as "data": digital photos, videos, *Word* documents, MP3s, saved game files, and so forth. This is the stuff that's either irreplaceable or difficult to reacquire, so you should take great care to protect it. Let's examine a few preservation strategies, shall we?

GET RAIDED

Implementing a RAID 1 array is a good place to start for data protection. In this type of RAID setup, every bit of data you write to your system is mirrored on two separate hard drives. So in the event of a terminal drive failure, you'll still have all your data intact on the remaining drive. Of course, in order to use RAID, you'll need a hardware RAID controller, either on your motherboard or on a PCI add-in card. The bigger caveat, however, is that RAID 1 only protects your data from drive failure; if your machine gets infected with a virus, or something else scrambles your data, it's gone! So even if you use RAID 1, it's still important you perform regular backups.

INVEST IN AN EXTERNAL BACKUP DRIVE

External hard drives are ridiculously cheap these days, so there's no excuse not to spring for an external backup drive. There are scads of drives on the market, and most of them include excellent backup software, but we recommend the 250GB Western Digital Media Center Dual-Option backup drive ($330, **www.wdc.com**). It's fast, roomy, and includes FireWire and USB 2.0 connections.

Most of the time, the backup software will have you set up a simple script that does something like "back up all of the contents of your C: drive every week and put it on the F: drive." Once all this is configured, the backup will run on its own according to schedule. These drives make backing up your system really painless, and we can't emphasize enough how important it is to keep a current backup of your data.

You have no excuse not to have an external backup drive, so either get a basic "drive in a box" type or splurge on something like the WD Media Center above.

TAKE CHARGE OF YOUR DOCUMENTS

Because most of us use the My Documents folder as a catch-all repository for everything from dog show photos to tax returns, it's a good idea to store this directory in the safest location possible. And, yes, you do have the option of pointing your My Documents folder to any location on any hard drive. To change the location of this folder, simply right-click it and select Properties, then click "move." A dialog box will open asking where you'd like to move it to, so select the new location (a new drive, a new partition, etc.) and click OK. When it asks if you'd like to move all your documents to the new location, click "yes." On the surface you won't notice any change at all, as your documents will still be there when you click My Documents, but your files will be safely stored on another drive.

Backing up data ranks right up there with flossing in terms of activities we look forward to, but with all your personal data in one folder, manual backups are quick and simple. So do yourself a favor—quit saving files to your desktop. Save them to someplace in My Documents, and then protect this folder with your life.

THE ART OF SAFE DOWNLOADING AND INSTALLING

There are few computing practices more dangerous than randomly downloading and installing apps and utilities. Sure, you can usually uninstall them, but some apps carry spyware payloads that are difficult or impossible to expunge from a system. Even in best-case scenarios, uninstalled apps can leave bits of data peppered across your hard drive.

We always check the user comments on popular shareware sites (such as Download.com) before installing new software. It's better to read about other people's misfortune than to experience it firsthand. Once you decide to try a new app, you should make certain you get it from a reputable source.

Also, if you really want to experiment with a variety of unknown apps from a popular shareware site, we recommend you create a limited user account in WinXP. (Go to Control Panel, Users, then click "Create

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new account." Make sure it's designated as a limited account.) By using the limited account, the shareware installer won't be able to install files in protected areas of your drive—like the Windows directory. Once the app is installed on the limited account, scan your computer for spyware. If nothing shows up, feel free to reinstall the software to your primary account.

Tricky folk, aren't we?

Current Drive
Diagnostic Code: ca94957c
This drive is failing. If you do not have a recent backup of the data please do so now if possible. Write down the diagnostic code and contact Maxtor via the internet www.maxtor.com Online(RMA) Return Merchandise Authorization is available 24 hours a day with a valid PowerMax diagnostic code. Select the Warranty Services link from our home page.
Press any key to continue.

You can always run a vendor-provided diagnostic utility on your drive, but be prepared for bad news.

KEEP YOUR DRIVE DEFRAG'D

When you install applications on your hard drive, the data is not written in neat, sequential rows across the platters, but rather wherever there happens to be room. Data belonging to sundry documents and programs are typically scattered all over your drive, so when you install a new program, it will be installed with a chunk of code here, a chunk of code there, and so forth. This condition is known as "fragmentation," because each file may be broken up and distributed over several different drive locations. Accessing a fragmented file takes longer than accessing one that's written sequentially, because the hard drive's read/write heads have to skip and jump all over the drive to pick up the pieces of the file.

You can remedy this situation with regular drive defragmentation, which causes Windows to pick up pieces of files and move them together into sequential arrangements (or at least as sequential as possible). The defragment utility built into Windows XP (really just a stripped-down version of Executive Software's *Diskeeper*) gets the job done just fine. We recommend defragging your drive at least once a month.

PAY ATTENTION TO DRIVE NOISE—IT MAY BE A CRY FOR HELP

Despite the furious activity taking place within a hard drive, these storage devices are usually exceptionally quiet, as the read/write heads float on top of the platters. What's more, newer hard drives use fluid bearings to reduce noise even further. During regular hard drive operation, all you should hear is the sound of read/write heads moving back and forth over platters, which produces a soft clicking noise. You should never, *ever* hear a noise that sounds like grinding or metal-on-metal rubbing.

If you ever hear any strange noises coming from your drive, *immediately* back up its contents. You should also download the drive diagnostic utility specific to your drive (it should be available on your drive manufacturer's web site). If you suspect your drive is having problems, download the appropriate utility, and run it to see if your drive is having a gastrointestinal disorder. You can also use the bundled Scandisk utility in WinXP, which is accessible by opening My Computer, right-clicking your drive, selecting Tools and clicking "scan now." ■

Maintenance Schedule

Following a strict regimen of antivirus scans and spyware sweeps *will* protect your PC from malware. The good news is you can probably configure your apps to do the legwork automatically

1. Download antivirus definitions—daily
2. Download anti-spyware definitions—weekly
3. Perform a full antivirus scan—weekly
4. Perform a full anti-spyware scan—weekly
5. Check firewall software for updates—monthly
6. Defrag your hard drives—monthly
7. Check for Windows updates—twice a month

WINXP DOs & DON'Ts

DON'T compress the contents of your hard drive to save space. Compression slows down your whole machine. Just buy a new drive.

DON'T download, install, and uninstall random apps and screensavers from the Internet. They're common vectors for web cooties.

DON'T open e-mail attachments from people you don't know, or executables from people you do know (they should know better!)

DON'T install Windows XP over a previous installation. Always format your hard drive and install Windows from scratch for optimal long-term stability.

DON'T install more than one antivirus utility and firewall. These programs need low-level access to the operating system; it can cause major problems for Windows if multiple apps are competing for resources.

DO block firewall access to programs you're unfamiliar with.

DO create Windows XP restore points before installing drivers, service packs, or other system-altering software.

DO be wary of "system optimization" software that doesn't tell you exactly what it's going to do! These apps usually deliver nothing more than snake oil.

DO clean the fans inside your PC case regularly in order to keep them running at maximum efficiency.

DO defragment your hard drive periodically to ensure maximum transfer rates.

DO run "msconfig" occasionally and trim your PC's startup programs to just the essentials.

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IS TO DESTROY THEM.

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PRESENTING...

the BEST, the COOLEST, the most ESSENTIAL software for PC power users

MAXIMUM PC's

THIRD ANNUAL SOFTY AWARDS

It's time. Once again, we gather to honor the best applications, utilities, and games of the past year. We're talking about the kind of stuff that's so good, we can't remember what life was like before using it.

It's not easy getting *Maximum PC* editors to agree on the 10 software titles that rose above all else throughout the past year, but two elements made it easier this year. First, we locked ourselves in a glass-walled conference room with an open box of doughnuts on the other side of the window. Second, we used the process of elimination.

Thousands of above-average, and even superior, software titles are released each year, but even the grandest can be crippled by feature bloat, unstable performance, or an interface uglier than a baboon's butt. We experienced deep-seated emotional angst on more than a few occasions, as we passed over useful applications and fun games because of a singular flaw. But it's a necessary part of the process.

At the end of the arguing, haranguing, and chair-hurling, we were left with 10 software titles and three games that represent the pinnacle of usefulness, stability, and value. Remarkably, many of them are free! Power users, you owe it to yourselves to give each a shot.

Now can we have our doughnuts?

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Firefox 1.0

Five years ago, Microsoft supposedly ended the browser war against *Netscape* when the dominant *Internet Explorer* emerged victorious. But while fat 'n' happy Microsoft toasted itself and coasted, users became increasingly fed up with the constant surge of security updates and living in a state of perpetual panic that *IE* would give hackers free reign over their PCs.

Is it any wonder we're all fleeing to *Firefox*?

Firefox is a bare-bones version of the open-source *Mozilla* browser, and it's the only Softy winner nominated by every single editor on staff—for the second year in a row! Much like last year's beta version, *Firefox 1.0* eschews the typical "everything and the kitchen sink" approach that cripples many applications. Instead, *Firefox* provides the bare essentials for browsing—fast speed and good compatibility—with vital advanced features like tabbed browsing and an integrated RSS reader. The secret sauce is its extensible architecture, which lets independent developers add whatever functionality they want via small, cross-platform extensions. Last time we counted, there were more than 150 extensions available, and more are being added every day.

If you need another reason to love *Firefox*, check out its security chops. It doesn't support the ActiveX applets that many spyware vendors use to breach your computer's perimeter, so *Firefox* is effectively immune to many vectors of infection for your PC.

It's about time *IE* got 86'd. Get *Firefox* now.

(Dig it: It's free, www.mozilla.org)

If you haven't installed *Firefox* yet, you're a chump. Everything *Internet Explorer* can do, *Firefox* does better. Get it now, and start loving tabbed browsing!

60 seconds with Firefox

The first thing everyone should do when they load *Firefox* is open a second tab. Go to File, New Tab, and get used to a better way of browsing. After that, go to Tools > Extensions and click the Get More Extensions link. This will take you to a web site where you can browse for all sorts of improvements.

Gaim

Sorry, *Trillian*, our passion was short-lived. We've been loving *Gaim* all year, and now we've decided we're happy together and don't need you anymore.

This open-source IM client might not support all the fancy skins that *Trillian* does, but it's not all about the outfits, is it? Instead, *Gaim* offers something that's changed how we use instant messaging: Rather than opening a window for each conversation, it opens just a single window, with a tab for each person you're talking (or not talking) to.

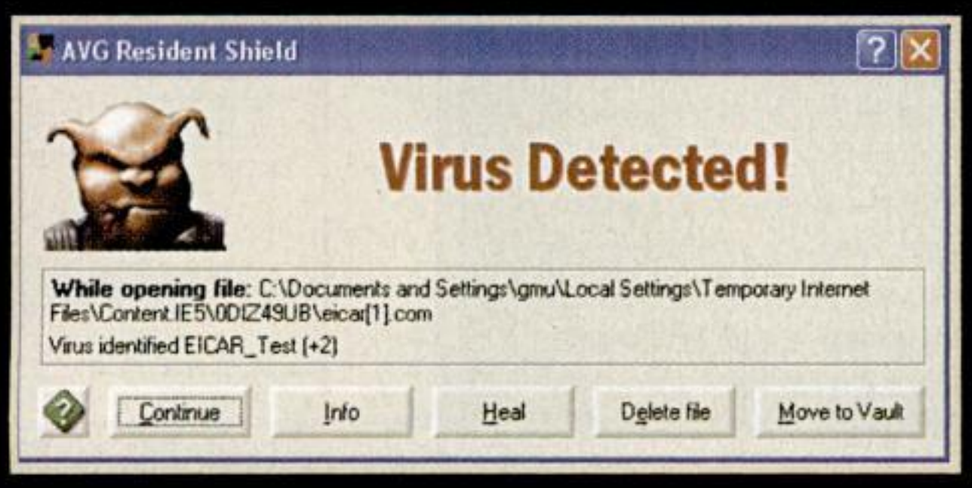
Gaim speaks all the major protocols—AIM, ICQ, Yahoo, and MSN. It's simple, effective, and doesn't crowd our desktops with scads of windows. That's something worth chatting about.

Gordo
Conversation Options Send As
Brian Lam
Mamboozo
Gordo
(13:11:26) Gordo: No it'll be in this afternoon. I've been goofing off watching the new Battlestar Galactica show.
(13:11:42) Will: ok.. what do you think of it/
(13:14:24) Gordo: The story arcs are really good, the effects are awesome for a TV show.
(13:15:01) Will: Do you like it better than Deep Space 9?
(13:16:32) Gordo: Ron Moore worked on DS9 and is behind BSG
(13:17:26) Gordo: DS9 is probably the best of the new trek series but BSG is because it's much darker and Moore has more control over it.
(13:18:16) Will: I think Logan might be on the sauce again
(13:19:08) Gordo: He is. He ate an entire jar of spaghetti sauce in the lab the other day.
Warn
Block
Send File
Remove
Info
Send

Placing each conversation in its own tab is genius, and it keeps our screens from filling up with loads of instant messages.

AVG Anti-Virus

If we had a public service award, Grisoft's *AVG Anti-Virus Free Edition* would win for its commitment to helping people. But we don't. Nonetheless, *AVG Anti-Virus Free Edition* wins a Softy for offering kick-ass virus protection that just happens to be free. It has all the essentials, including a resident memory scanner, an e-mail scanner, and scheduled hard disk scans. But what really amazes us is the frequency of the virus definitions and application updates available from Grisoft. Even though Grisoft offers commercial versions of *AVG Anti-Virus* for specialized environments, the free version doesn't nag you with registration messages or bludgeon you with advertising pop-ups. It's truly a full-featured program for free. **(Again, free! www.grisoft.com)**



The Shrek clone in *AVG* warns you if you're trying to download an infected file.

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Nero 6 Ultra Edition

This major update to *Nero 6* was initially called *Nero 6 Ultra Edition Reloaded*. In the past, we've been disappointed by other media with "Reloaded" in the title, but this version of Ahead's CD and DVD disc mastering suite is exactly the sequel we've been waiting for. It's an absolute must for anyone who's got an optical drive in the house. If you take the time to play with the other toys in the box, you'll find that many of the 15 bundled applications and utilities rival stand-alone products that sell for the same price as the entire *Nero* suite. As an example, take *Nero Vision Express 3*, a fast, idiot-proof DVD authoring program with a mean transcoder. Or *Nero MediaHome*, which allows you to stream multimedia over your network. Or the sophisticated photo editor.

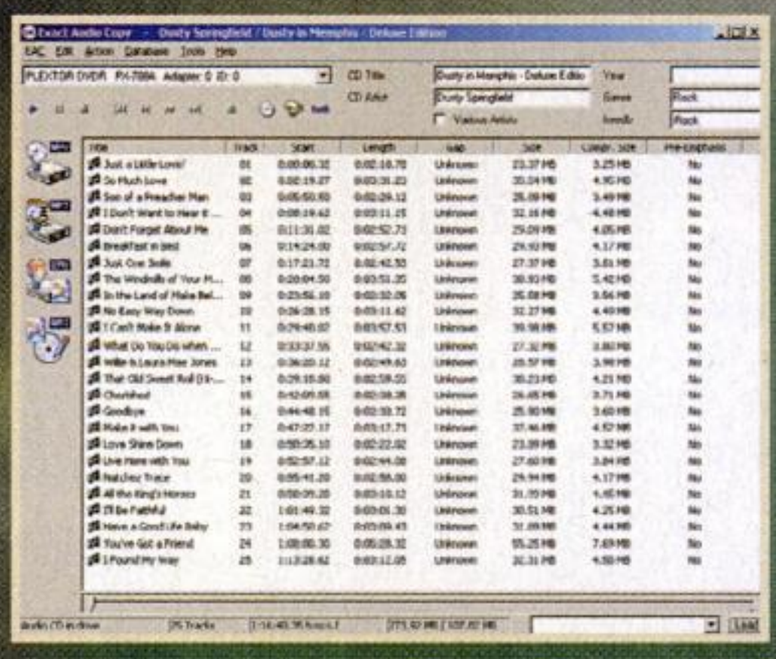
What puts *Nero* ahead of Roxio's excellent *Easy CD Creator 6* is Ahead's obsessive updating of the software. You're free to download updates, improvements, and upgrades throughout the lifespan of your version number, and if your drive manufacturer adds a new feature in a firmware update, chances are good *Nero* will support it within days of its release, if not before. Few applications are essential to PC power users, but *Nero 6 Ultra Edition Reloaded* is one of them. And it doesn't need Monica Belluci to get our attention. **($100 boxed, $70 downloadable, www.nero.com)**

Put your DVD burner to work with *Nero Vision Express 3*, which lets you create menus with animated buttons and backgrounds.

Exact Audio Copy

Ripping a massive collection of CDs to your hard disc is a drag, but doing it twice because of skips or errors from damaged discs is even worse. That's why the only ripper we use is *Exact Audio Copy*. It's slower than other ripping applications—and in the case of severely worn discs, agonizingly so—but you'll get the best quality audio possible. That's because *EAC* compensates for the overly permissive error-correction built into CDs by scrubbing over errors until the results match after several consecutive reads. If *EAC* can't rip it, nothing can.

Pair it up with the open-source *LAME* MP3 encoder, and you've got a free MP3 factory that's superior to anything you'll find on store shelves. **(Free, but send the author a postcard, www.exactaudiocopy.de)**



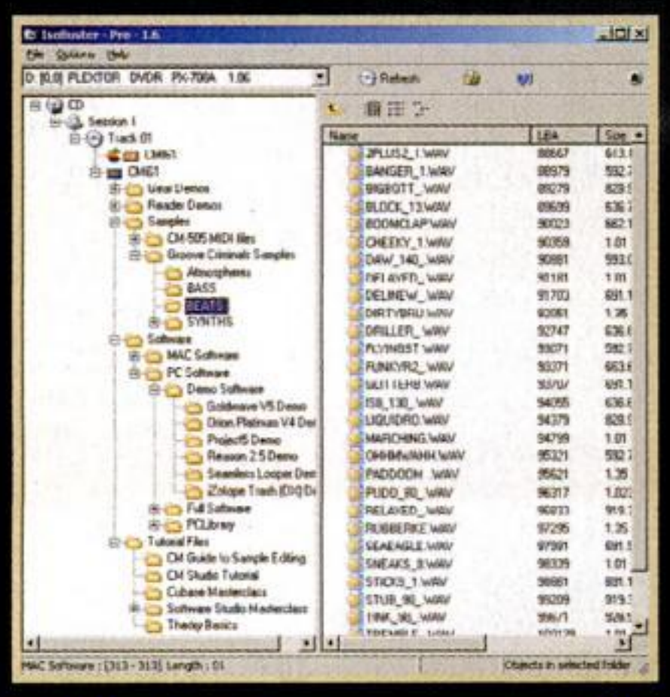
If you care one whit about high-quality audio rips from your CDs, you cannot live without *Exact Audio Copy*.

60 seconds with Exact Audio Copy

Grab the *LAME* MP3 encoder at http:// V mitiok.cjb.net (use the BitTorrent link to download if possible). Extract the contents into the *EAC* folder, and then launch *EAC*. During the initial configuration routine, *EAC* will search for the *LAME* executable. It's faster just to cancel the search, and then manually point *EAC* to the location of lame.exe. Leave the other options at their defaults. Now *EAC* will give you the option of ripping the contents of an audio CD and automatically compressing the results to MP3.

ISOBuster

We can't count how many times in the past we've longed for software that would let us do so-and-so or such-and-such. But we do know that many of those times, *ISOBuster* answered our prayers. Yearning to rip video from a Video CD to an MPEG file? No problem. Desperate to extract raw data from a damaged CD? You got it. Wanna check the quality of a critical disc burn? You betcha. Feel like poking into the contents of a disc archive to retrieve a single file? Roger that. Newbies won't find much to celebrate in this utility, but *ISOBuster* is essential to those who dabble in dark craft of disc burning and disc image files. **($26, www.isobuster.com)**

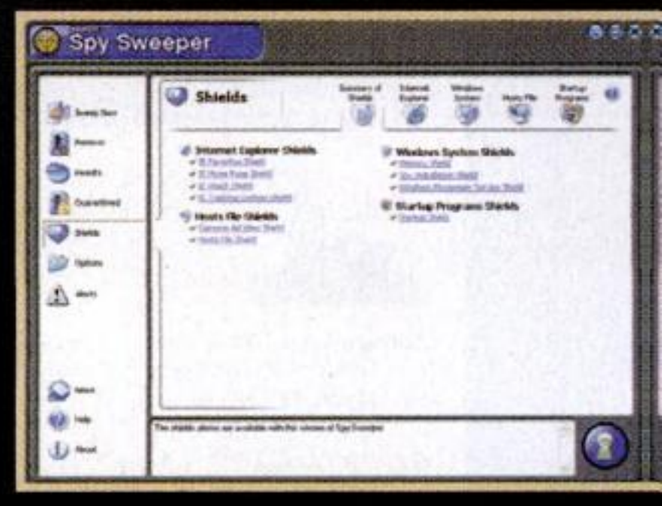


***ISOBuster* is a software pinata full of helpful optical drive and disc image file utilities.**

Webroot SpySweeper

The latest version of Webroot's *SpySweeper* is the perfect first defense against spyware and other ITD's (Internet-transmitted diseases). Like its retail competitors, *SpySweeper* can perform classic stunts like monitoring *Internet Explorer* and asking for your permission before allowing a link to some tacky porn site to show up in your Favorites. But it also sports some black-belt moves, such as detecting and reporting programs that want to restart every time your PC starts—a classic spyware technique.

SpySweeper runs in real-time, so it's able to detect incursions as they occur. While this app is our favorite protective cloak, we still recommend that you supplement it with a good antivirus program, as well as *SpyBot* and *Ad-Aware*. A little extra protection never hurts. **($30, www.webroot.com)**



***SpySweeper's* strength is its real-time protection from many different forms of spyware.**

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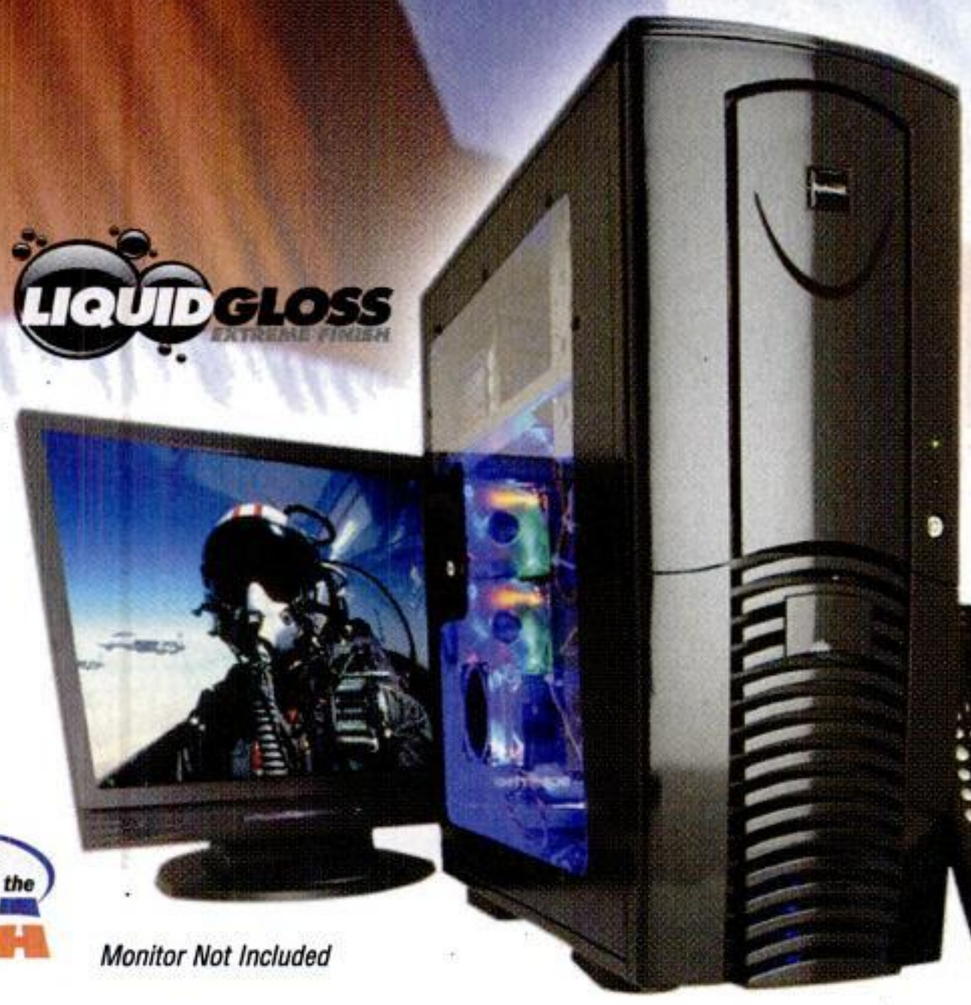

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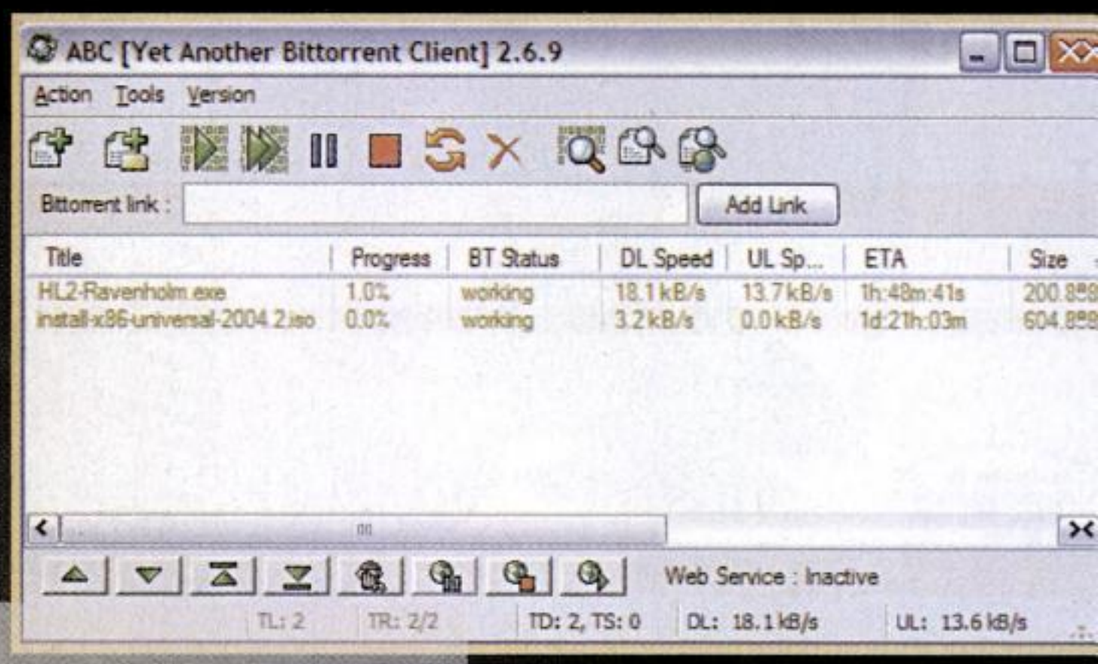
BitTorrent

Not long ago, when people spoke about the BitTorrent file transfer protocol, they used the same hushed tones people used when referring to Voldemort, the wizard who killed Harry Potter's parents. Along with IRC, no-CD cracks, and USENET binaries, BitTorrent has been associated with the surreptitious exchange of copyrighted materials.

OK, it's *still* associated with the surreptitious exchange of copyrighted materials. But the protocol's unique approach, which broadcasts portions of files and requires users to upload these portions to others even as they download more "bits," allows content providers to save on bandwidth costs. It's so efficient that Valve Software, makers of *Half-Life 2*, offered BitTorrent creator Bram Cohen a position to help refine its own online file distribution network, dubbed Steam.

The possibilities are staggering. We might soon be downloading episodes of television shows to watch at our leisure. Independent game and film publishers could use BitTorrent as an inexpensive content delivery service. If content companies aren't already considering ways to use this emerging distribution technology, now's the time. BitTorrent is so popular that one recent estimate claims that it's responsible for more than 35 percent of all Internet traffic, which is more than every other P2P file-sharing service *combined*. That's not too surprising—it's one of the most important software innovations to come along in ages. **(Free, http://bittorrent.com/)**



60 seconds with BitTorrent

The first step in using BitTorrent is finding a client to use. A lot of people use the original *BitTorrent* client created by the inventor himself, but we prefer either *ABC* or *Shareaza*. Once you have a client up and running, you then need to find torrents, which are links to files that can be downloaded. Once you find a torrent file, simply save it to your hard drive. Then, either drag the torrent file into the BitTorrent client or double-click the torrent file.

As shown here, we use BitTorrent to download free Linux distributions and trailers for upcoming games.a

#1 DVD Ripper

At last, a DVD ripper that does the *whole* job. After launching this handsome (if vaguely Mac-flavored) application and pointing it to the correct files, you're just a single click away from a Divx file of the main movie from your DVD-Video disc, at a fraction of the size of the full DVD. Like all great applications, the most important task is easiest to accomplish, but experts can scratch beneath the surface to find configuration options such as individual chapter extraction, bitrate adjustment, and subtitle support.

Oh, by the way, thanks to the Digital Millennium Copyright Act, *#1 DVD Ripper* is illegal (because it strips DVDs of their encryption). This is ridiculous, and certainly won't prevent us from giving it a Softy Award. The reality is that there are plenty of legitimate uses for *#1 DVD Ripper*, such as making a DVD streaming box to play movies you own on your home LAN, or watching movies on your laptop without having to carry around a bunch of DVDs.

#1 DVD Ripper is the best DVD ripper around, and something you should investigate if you want to exercise your fair use right to view and use the content you purchased your way, not the government's way. **($35, www.dvdtox.com)**

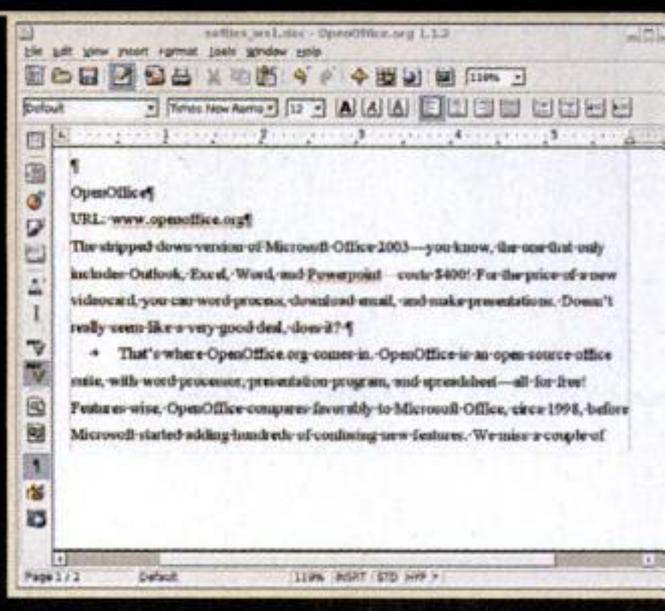
With the click of a single button, *DVD Decrypter* takes ripped DVD-Video and spits out a Divx file for playback while traveling.

OpenOffice.org 1.1

It's easy to think we're all just renters in a Microsoft world. Only without rent control. But that's just not true. There's an alternative to *Microsoft Office*, and it doesn't require you to sacrifice compatibility with ubiquitous *Office* documents. And it's constantly improving and evolving.

OpenOffice.org 1.1 (yes, the name includes the .org) is an open-source office suite that includes a word processor, a presentation program, a spreadsheet application, and an illustration program for diagramming. The suite compares favorably with *Microsoft Office* circa 1998, before Microsoft started adding hundreds of dubious new features. While we miss a couple of those advanced features—the format painter is an all-time favorite in the *Maximum PC* offices—many of them can be added to *OpenOffice.org* with small plugins.

The stripped-down version of *Microsoft Office 2003*—you know, the one that includes only *Outlook*, *Excel*, *Word*, and *PowerPoint*—costs $400! Doesn't really seem like a very good deal, does it? If you can live without *Outlook*, you'll be astounded at how great a free office suite can be. **(Free, www.openoffice.org)**



Looks just like *Word*, doesn't it? With Writer, you'll process words just like in *Word*, but for *free*.

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HALF-LIFE 2

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PC GAMER

1998. Half-Life® sends a shock through the game industry with its combination of pounding action and continuous, immersive storytelling. Valve's debut title wins more than 50 game-of-the-year awards on its way to being named "Best PC Game Ever" by PC Gamer, and launches a franchise with more than eight million retail units sold worldwide.

NOW. By taking the suspense, challenge and visceral charge of the original, and adding startling new realism and responsiveness, Half-Life 2 opens the door to a world where the player's presence affects everything around him, from the physical environment to the behaviors even the emotions of both friends and enemies.

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GAMES OF THE YEAR!

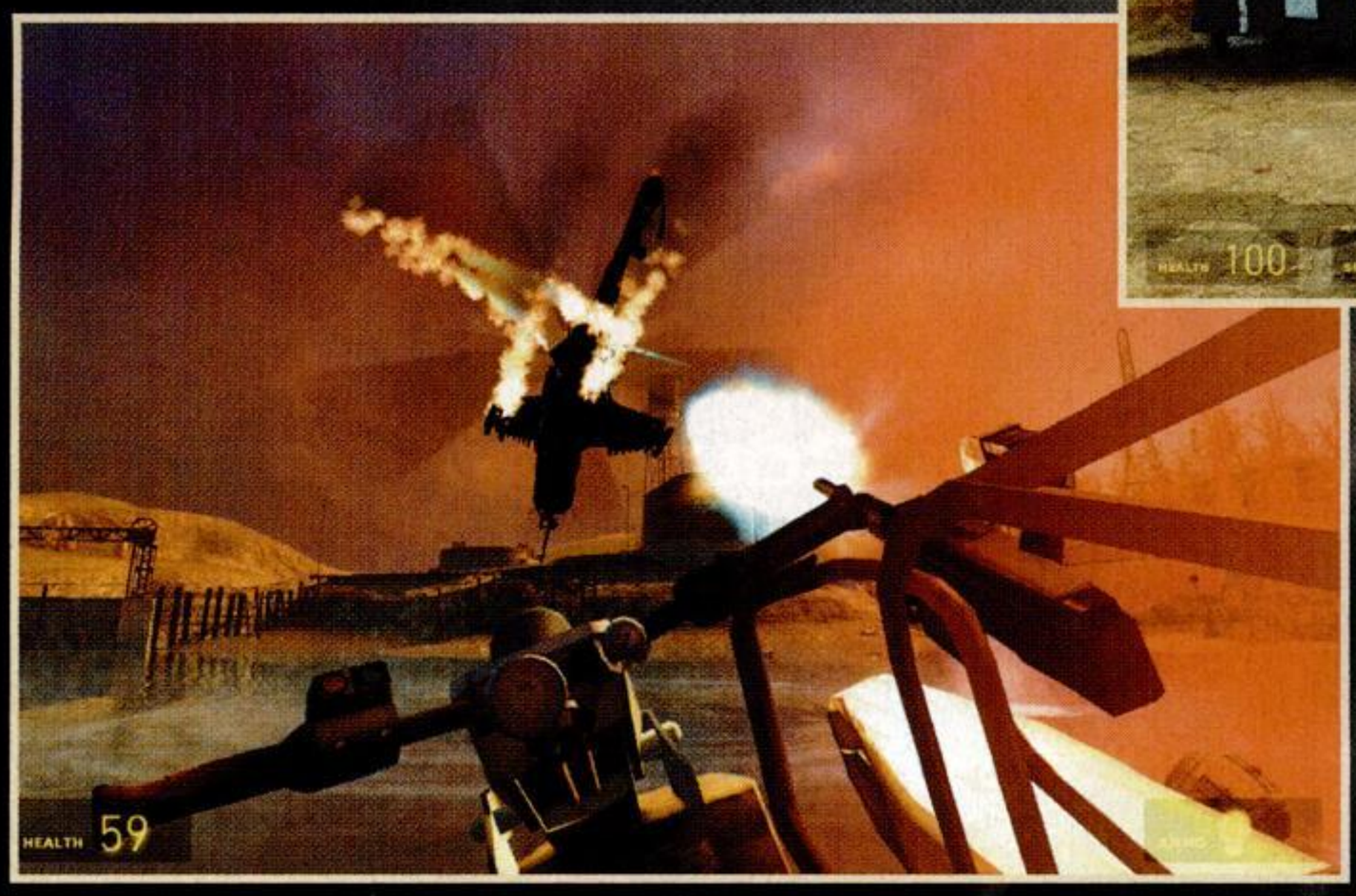
In one of the juiciest, most competitive years in PC history, these three ground-breaking titles stood out from the crowd and reaffirmed the PC as the ultimate gaming platform.

HALF LIFE 2

These days, most games excel in one or two categories of design—think *Doom 3's* graphics and *Call of Duty's* gritty representation of the chaos of war. But *Half-Life 2* excels in *all* categories. From graphics to story to some of the most exhilarating action sequences we've ever experienced, we have no reservations calling this the finest first-person shooter in the history of gaming, and one of the best overall games ever created.

One staffer at *Maximum PC* showed *Half-Life 2* to a friend who doesn't play first-person shooters; the friend's initial reaction was to stare at the screen with his mouth agape. "Unbelievable," he finally said, as he leaned in closer to examine the game's brilliant textures and lifelike animation. After he spent several minutes wandering around City 17's new-arrival train station, he summed up *Half-Life 2* succinctly: "This is the most amazing thing I've ever seen on a PC." Indeed.

($50, www.half-life2.com)



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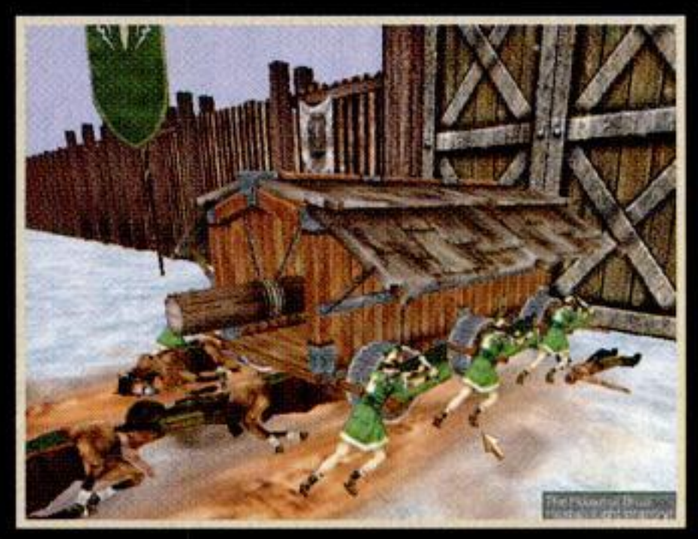
ROME: TOTAL WAR

Combine a real-time combat simulator with a turn-based empire-building game, and drench the whole affair in some of the most gorgeous graphics to ever grace the PC, and you've got *Rome: Total War*. During the turn-based portion of the game, you can make far-reaching decisions about everything from your tax policy to which monarch will marry your firstborn daughter. But the real fun starts when you engage in combat. After taking elevation, cover, and weather into account when you plan your attack, you can launch your strike and watch 10,000 individually rendered soldiers beat the crap out of each other. *Rome: Total War* is the first strategy game we've ever played that had us picking up Sun Tzu's *The Art of War* instead of a strategy guide when we wanted advice. **($50, www.totalwar.com)**



FAR CRY

Crytek? Who? Huh? What? That's what we were saying when the screen shots of *Far Cry* first hit our e-mail inboxes. But for months after playing *Far Cry*, this was the only developer on our minds. Combining furious action, astonishing AI, and humongous maps, *Far Cry* was a surprise attack in the normally predictable world of PC gaming. Even compared with the subsequent releases of *Doom 3* and *Half-Life 2*, Crytek's homegrown 3D engine looks spectacular, rendering lush foliage and glinting water onto maps the size of Montana, all while maintaining playable frame rates.

Another surprise in *Far Cry* was the open-ended gameplay on many of the missions, meaning we could take several different paths to arrive at an objective. This adds strategy and suspense to the experience—even the second time around. **($30, www.ubi.com)** ■

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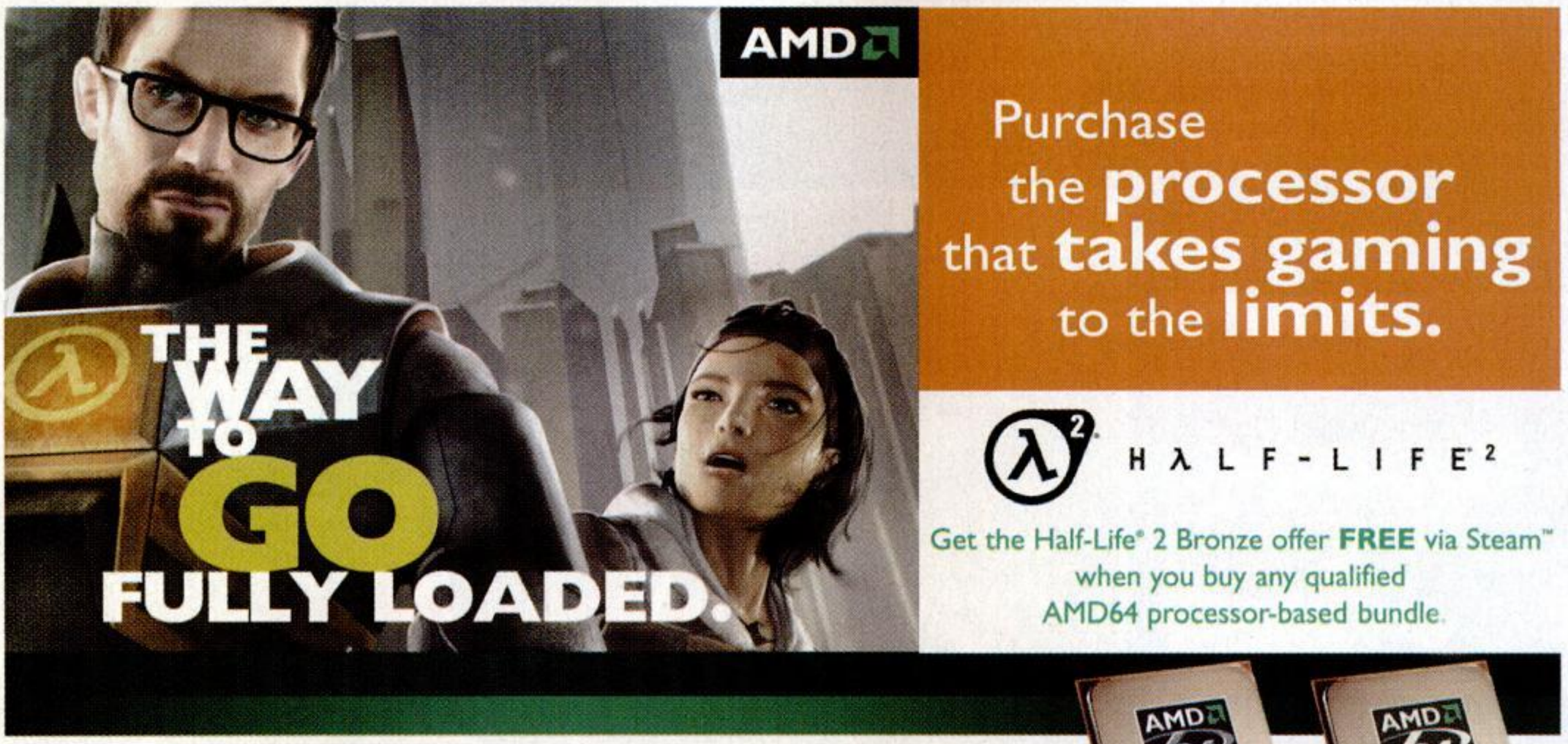
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AMD 64 Athlon FX
AMD 64 Athlon

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THE Linux DIARIES

BY WILL SMITH

For six electrifying months, our intrepid editor-geek abandoned the comforting cradle of Windows XP and journeyed into the cold unknown to do all his computing work—*everything*—in Linux, the rebel OS.

HERE'S HOW HE DID IT. AND HOW YOU CAN TOO

Linux. Like many PC geeks, I'd heard of the open-source operating system, and had even dabbled with it for several hours every year. But I'd never really considered using it for day-to-day computing. Until last June, that is, when I decided it was high-time for an in-depth, first-hand look at the power, flexibility, and viability of the Linux OS.

Why would you want to use Linux? There are a number of reasons: There are no fears that hardware-level digital-rights management will be integrated with Linux anytime soon. The price is definitely right—Linux is free; all it costs is the time you spend on it. And if you're not concerned about price or privacy, Linux is an opportunity to learn new things!

Before I embedded myself into Linux territory, I set up some ground rules. First, no dual-booting Windows. I knew if I gave myself the ability to load Windows when I got frustrated, I'd be back on WinXP faster than Ruben Stoddard on a Twinkie. Second, I refused to allow any Linux issues to add to my already-crushing workload (I vowed to push any excess work onto Associate Editor Josh Norem). Third, I was determined to learn to perform every task with my Linux box that I could with Windows.

With my goals laid out, the next task was to pick a Linux distro to use. A **distro** is simply a collection of software, including the Linux **kernel**, as well as a collection of apps and tools that make installing and maintaining a Linux system easier.

After two weeks' worth of research, I chose **Debian**. I picked Debian for one reason: the integral **apt-get** package-management system. Surprisingly, one of the most difficult challenges for the Linux newb is getting the applications installed properly. With Linux, many apps depend on other applications, known logically as **dependencies**, to function. In Debian, installing most new apps is as simple as selecting a package and telling apt-get to install it. Apt-get then downloads the program (and all the required dependencies) from the Internet and automatically installs everything you need.

So something Linux this way comes. This is my story.

THE Linux DIARIES

June 30, 7:31PM

Waiting for Jigdo

I'm off to a crawling start. The first hurdle to installing Debian is downloading ISO images of the actual installer. Debian uses a small Windows app called **jigdo** (short for Jigsaw Download) to go out onto the Internet, download all the necessary files from Debian's online repositories, then create ISO files you can burn with your Windows CD burning app of choice.

The only problem is that for a full install, jigdo will pull down more than a gig of software, and there's no indication of the download status! I guess I'll finish it up tomorrow morning. Despite the slowdown, my hopes are running high.

July 1, 11:34AM

Installing the OS

It's not idiot-proof, but installing Debian is much easier than I anticipated. The hardest part was configuring the hard drive partitions. I separated the **root** partition, where all the operating system files and applications are stored, from the **home** folder, where each user's files and personal apps are stored. I ended up using a smallish 7GB partition for the root partition, one gig for the **swap** partition, and the rest of my drive for the home directory. (The swap partition is similar to the Windows page file, but it uses a special file system and resides on its own partition in Linux).

Picking my filesystem was also a challenge. I won't get into details here, but after trying a couple different things, I formatted both the root and home partitions of my machine using the **ReiserFS** filesystem. It's a nice balance of speed and reliability.

July 1, 1:23PM

Getting XFree86 working

I managed to get a working install of **X windows**, Linux's graphical interface, on the first shot. I then promptly broke X by choosing the wrong video driver. Some quick work with the text editor **nano** let me reconfigure X from the command line and get it working again, although I'm still limited to 800x600 on a single monitor. I promise myself that I'll get running at a higher resolution soon.

I'm getting into the habit of using the command **su** to switch to the all-powerful root account while I'm logged in as me. It's much easier to use su than it is to log out and log back in just to make a small change to a config file.

How to use Jigdo

The fastest way to get CD installer images for Debian is to use Jigsaw Download—jigdo for short. Download the Windows version of jigdo from **http://atterer.net/jigdo/** and unzip it to C:/jigdo.

Open a command line (press the Windows key and r, then type `cmd`) and type `cd /jigdo` to change to the jigdo directory. Next, you should run **jigdo-lite**, which will ask you for the jigdo file for the ISO image you want to create. Open your browser and go to **www.debian.org/CD/jigdo-cd/#which**, where you can find the URLs for the .jigdo files you'll need. I used the DVD version of the "testing" distribution. It has all the **packages**—Linux parlance for prebuilt applications and the info your system needs to run them—most people will need, and support for most recent hardware. If you don't want to download four gigs of data, you can get almost everything you need in the first two installation CDs.

In addition to the testing distribution (named Sarge), there are two other flavors of Debian: stable and unstable. The stable distro uses rock-solid packages, and is frequently updated for security, but hardware compatibility can be a problem, especially if you have Serial ATA or RAIDed hard drives. Unstable, codenamed Sid, contains the latest bleeding-edge software. It's frequently updated, and will support all the latest hardware, but may not be as stable or secure as the stable or testing builds.

Because this is the first time you've downloaded anything using jigdo, you can choose the default for the next two or three options. When jigdo prompts you for a mirror to download the files, I highly recommend you go to **www.debian.org/mirror/list** and choose a mirror near you. Now it's time to sit back and wait. Even on a good broadband connection, it will take several hours to download all the files.

Installing Debian

Entire books have been written about installing Linux for the first time, so there's really no way I can cover everything in this small space. However, great documentation on the Debian install process is available at **www.debian.org/releases/stable/i386/install**. I suggest you give it a cursory read while you're waiting for jigdo to finish downloading. I did pick up a couple of tips after performing three separate Debian installs:

- Avoid the **ext3** file system. It looks like a good choice based on the info presented at the config screen, but it's very slow compared with the other options—like ReiserFS.
- If you do a CD install, make absolutely sure you download and burn the first two CDs. Otherwise you'll have to download all the files for your GUI from the command line.

Using nano to configure X windows

Unlike Windows, where important configuration details are buried in the Registry, most of the config files for Linux are plain text files. Debian includes several excellent graphical text editors, but it's also important you learn to use a command-line text editor in case X windows won't work. I tried several, and found nano to be the easiest for a newbie to use.

If you chose the right packages during the Debian install, you should have a working X windows install. If you don't, you can install the packages you need by typing `apt-get install gnome`. Then it's time to open your X windows config file by typing `nano /etc/X11/XF86Config-4` at the command line.

Nano works just like *Notepad* or any other text editor. Move the cursor to the area you want to edit, and type your changes. When you want to exit the program, press ctrl+o to save your file, and ctrl+x to exit the application. It's really that simple.

Your XF86Config-4 file controls the resolutions you'll be able to run in the GUI. To ensure you don't destroy your monitor, consult your display's documentation (either in print or online) to verify the horizontal sync and vertical refresh rate. Then, in nano, scroll down until you see a line labeled `Section "Monitor"`. Change the HorizSync and VertRefresh lines in that section to match the values in your monitor's doc. Make sure you get these numbers right—the wrong setting can destroy your display.

Now scroll down to the line labeled `Section "Screen"`, and change the `DefaultDepth` to 24. That sets your color depth to 24-bits. Next, you'll need to set the available resolutions. Go to the `SubSection "Display"` that says, `"Depth" "24"` and add the resolutions that you want to run on the modes line, with each resolution inside quotes. My mode line looks like this:

```
Modes "1600x1200" "1280x1024"
"1024x768" "800x600"
```

Save your file by pressing ctrl+o and exit nano by pressing Ctrl+x. Start X

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windows by typing `gdm`—Debian's default login manager.

Get ready to install video drivers

Most modern videocards have Linux drivers. You should be able to find them on the manufacturer's web site in the same place that you would find the Windows drivers. We chose an nVidia card because those drivers have a reputation for being easy to install.

But before you can install 3D-accelerated nVidia drivers, you'll need to download the source files for the kernel you're using. First, you need to find out what version of the Linux kernel you're using. Open a terminal and type `uname –r`; you should see something like `2.6.8-1-686-smp`. That's your kernel version and architecture. You'll need to download the package `kernel-source-2.6.8` and two header packages: `kernel-headers-2.6.8-1` and `kernel-headers-2.6.8-1-686-smp`.

Type `apt-get install <each package name>` to install the necessary files.

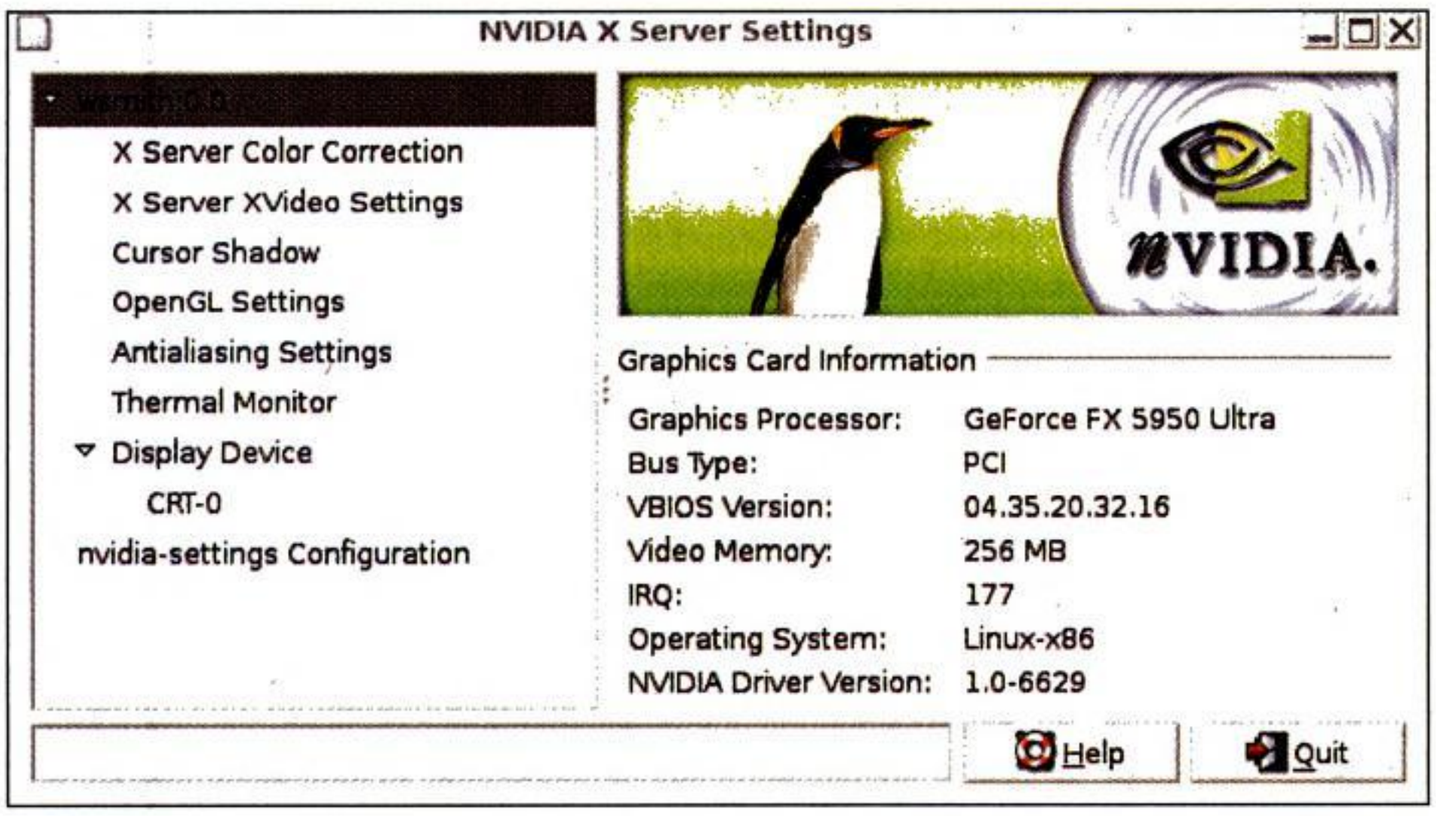
Install the nVidia 3D driver

First, download the latest Linux display drivers from nVidia's web site. The install process is relatively straightforward, but you first need to exit X windows before you can get started. Because Debian uses **GDM**—one of several login GUIs—as its front end, killing GDM will kill X windows. The easiest way to stop GDM is to switch to another console by pressing Ctrl+Alt+F1. Don't worry, you can switch back to the GUI by pressing Ctrl+Alt+F7. Log into the terminal using your root account and type `/etc/xinit.d/gdm stop`.

Now that X isn't running, you can run the nVidia installer. Use the cd command to switch to your home directory—for me the command is `cd /home/wsmith`—and mark the driver file you downloaded as executable (`chmod +x <filename>`). This tells Linux the file is a program. Then you can run the file by typing `./<filename>`.

The installer will walk you through the process. Go ahead and read all the prompts, but the default options should work fine. You shouldn't worry about the riva128 compatibility warning that pops up. This shouldn't apply to you—unless you have an ancient Riva128 vid card. In which case, you have more serious problems.

Once the driver module has installed, you need to edit your XF86Config-4 file again. Open it in nano (`nano /etc/X11/XF86Config-4`) and scroll down to the `Section "Device"` line. Change the driver line from whatever it was to `nvidia`. Save the file and exit. Restart GDM by typing `/etc/xinit.d/gdm start`. If everything goes well, you should see the graphical interface and a login prompt.



Along with the nVidia 3D accelerated drivers for Linux comes the nVidia control panel. You can use the nVidia-settings applet to tweak antialiasing and OpenGL settings.

July 1, 2:47PM
Install the kernel source
Now that X windows seems to be working, I went to nVidia's web site and downloaded its 3D accelerated binary drivers. Unfortunately, a prebuilt driver isn't included for my Debian-compiled 2.6.8 kernel. To fix that, I had to download all the source-code files the driver needs to work with my kernel. Luckily, that was a snap with apt-get.

July 1, 6:12PM
Power of 3D acceleration—ACTIVATE!
With all the kernel source and header files installed, it was easy to install the nVidia X driver. All I had to do was stop X windows and run the nVidia-installer application. Once that was done, I opened up /etc/X11/XFree86-4 with nano and changed the driver line from `nv` (the unaccelerated nVidia driver that ships with Debian) to `nvidia` (the 3D accelerated driver).

Why you shouldn't run your system as root

The root account is similar to the Administrator in Windows XP in that it can do anything. Common wisdom among Linux propeller heads is that logging into your system as the root account is a bad idea. The reason is twofold. First, as a normal user with normal permissions, it's very difficult to make a mistake or delete something that will prevent the system from booting. Linux doesn't have the thin candy shell that Windows does and frequently fails to put forth the, "Are you sure you want to do this?" query before you do something that will hose your system.

The second reason is security. If you regularly run as root, any applications that you run—from the Java applet on a web page down to files you download from the net—run with full root privileges. Those apps can delete files and format partitions as they want.

It's a pain in the butt to constantly switch back and forth from your user account to the root account, so there are tools that let you temporarily log in as root from your normal account. Just open a terminal window, type `su`, and enter the root password when prompted. Any application you start will have root privileges, even graphical apps!

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THE Linux DIARIES

July 1, 8:34PM

Connect to our file server

Now that my display is working at a normal resolution and refresh rate, my next task is to gain access to shared folders and files on *Maximum PC's* office server. Our server uses fairly typical Windows 2000 file shares, so I had a couple of options. I ended up using **cifs**, one of the protocols that Windows file shares can use. This allowed me to mount the file shares I need as part of my normal file system.

July 2, 2:04PM

A brief note about Desktop Managers

I've already talked a little about X windows, but I left out something really important. At the most basic level, all that X does is draw windows on the screen. It doesn't create a Start menu analog or a Desktop where you can store frequently used files. There are two other software packages that do that—*KDE* and *Gnome*. I'm using *KDE* for now, because it seems more geared for power users who want to be able to tweak everything about their UI. Nicely, if both *KDE* and *Gnome* are installed, switching between them is as easy as choosing a different Session when logging into the system's graphical interface.

July 6, 8:21AM

Permission problems bite

As I was getting ready to replace my trusty Windows box with my Linux machine, I realized I couldn't connect to the file server any more. Luckily, fixing that was as easy as giving my user account permission to access the share in the **fstab** file (fstab is the file that Linux uses to store info about all the file systems it can connect to).

July 7, 12:12PM

Another problem: I can't print!

Color me surprised! It's been harder to get printing working than it was to install the operating system. Luckily, we use a fairly common network printer here at the *Maximum PC* office—an HP Laserjet 6000. After some futzing around, it suddenly just started working.

Connecting to fileshares

If you want to transfer files from a Windows machine to a Linux box, the easiest way is to mount a Windows shared folder onto your Linux box. The easy way to do this is to add a line to your `/etc/fstab` file. Here's how you do it.

You'll need to be root to edit fstab, so open a terminal and `su` to root. First, you'll need to create a folder to mount the network share in—I used `/mnt/share`. To make the directory, type `mkdir /mnt/share`. Then open fstab in **kedit** by typing `kedit /etc/fstab`. You'll need to add a line for your file share below the last line in the file. It should be constructed like this:

`//server/share /mnt/share cifs exec,credentials=/etc/cifspw,uid=yourLinuxusername`.

This tells Linux to mount the share at //server/share in the /mnt/share directory on your hard drive using the cifs protocol. It tells the OS to use the username and password stored in /etc/cifspw and to behave as though your account owns all the files in the share.

Make sure there's a carriage return at the end of your fstab file. The OS expects it to end on a blank line. Save the file, and close it, but don't close kedit. You need to create a credentials file with your username and password.

The credentials file should have two lines, `username=yournetworkusername` and `password=yournetworkpassword`. That's it. Save it as `/etc/cifspw` and exit kedit. To connect to the fileshare, all you have to do is type `mount /mnt/share`. The next time you reboot, the share will be connected from the start.

Nine Linux apps I couldn't live without

Firefox: Increasing market share means I rarely see a web site that's *IE*-only.
Thunderbird: Fast e-mail with good anti-spam capability makes *Thunderbird* my favorite Linux e-mail proggy.
GAIM: This multiformat instant-messaging client helps me stay in touch with friends on AIM, ICQ, Yahoo, and MSN.
OpenOffice.org: *Word*, *Excel*, and even *PowerPoint* files work great in *OpenOffice*.
The Gimp: For my typical *Photoshop* tasks, *The Gimp* works just as well.
Wine: *Wine* is not an emulator, but it lets me run those few Windows apps I can't live without.
Rhythmbox: It doesn't seamlessly integrate with my iPod like *iTunes* does, but it's the best jukebox on Linux.
Ximian Evolution: The open-source *Outlook* clone keeps my calendar, tasks, and contacts handy. Unfortunately, it still won't sync with my Pocket PC.
Synaptic Package Manager: Call it apt-get's graphical big brother. *Synaptic* adds lots of advanced search features, which makes finding the perfect package even easier.

Massaging your permissions

Every file on your Linux machine has certain permissions. The permissions control everything—including the users' ability to open, change, delete, and execute files. We've already made one file executable using **chmod**, but you usually won't have to manipulate file permissions manually. The trick is to know where to store your files.

For example, everything in your home directory, which is usually /home/username, belongs to you. You can do whatever you want with files in that directory. If you're the only person using the machine, you can even install applications in your home directory, although you're usually better off installing your apps in a branch of the /usr/ directory.

If you have permission problems with files in your home directory, it's usually because you accidentally created or modified a file while you were logged in as root. Those files will then belong to the root account. To restore ownership to your account, you can use **chown**, which stands for "change ownership". For example, to reclaim ownership of a file named foo.txt, I would use the command `chown wsmith foo.txt`. Of course, this only works when I'm logged in as root.

Printing in Linux

Printing can be problematic, and Linux's main printing system—**CUPS**, short for common UNIX printing system—doesn't make it easier. Depending on the printer you have and the connection you use, setting up printing might be a five minute task or a nightmarish foray into the underbelly of the OS. Making any printer work in Linux is extremely complex—I can only recommend a couple of excellent sites that I used to get my printers working. I started at **www.cups.org**, but found that the documentation was more in-depth than I really needed. Then I went to **www.linuxprinting.org** and read their CUPS Quick Start, which helped me find a driver for my LaserJet and get printing in minutes.

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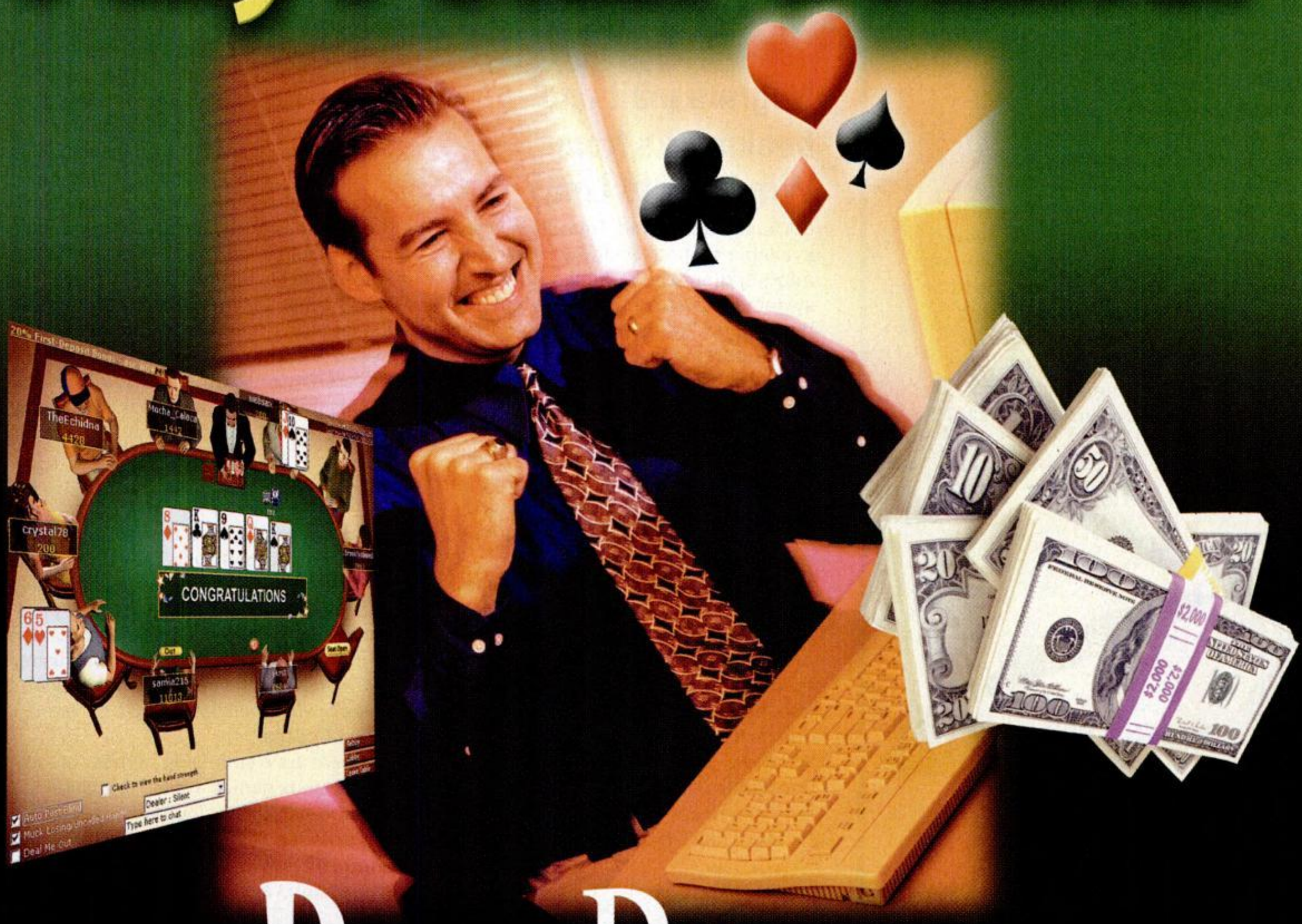

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THE Linux DIARIES

July 7, 1:17PM
All Linux—all the time
I'm now running Linux all the time on my desktop. I used the graphical *Synaptic Package Manager*—a front end for apt-get—to install the *GAIM* IM client, *OpenOffice*, and *The Gimp*, an advanced image editor. At the time, I had to manually install *Firefox* and *Thunderbird*, but now they're listed in the Debian package repositories, so you can use *Synaptic* to install them as well. I even managed to get my e-mail from *Outlook* on Windows to *Thunderbird* on Linux!

July 14, 4:39PM
Linux FTP clients suck
I'll admit it—I'm a creature of habit. I've used the same FTP client on Windows for most of the last decade—*Leech FTP*. When I looked at the FTP programs for Linux, I didn't find one I liked. Instead, I fired up *Wine*, an application that lets me run some Windows apps on Linux, and downloaded *Leech*. It didn't cause any hassles, and worked well. Hallelujah!

July 15, 12:42PM
It's time to try gaming
Because *Leech* works so well with *Wine*, I figured it was time to try some games on Linux. I managed to get the Linux versions of *UT 2004* and *Enemy Territory* working, but I experienced problems when I tried using *Cedega* (**www.transgaming.com**), which maps DirectX functions to OpenGL functions. Theoretically, this lets you play more DirectX games on platforms that don't support DirectX. *City of Heroes* was the only modern game that worked well. Sigh...

Migrate mail and bookmarks from Windows to Linux

Because *Firefox* and *Thunderbird* are available on both Windows and Linux, migrating between the two operating systems was surprisingly easy. First, I loaded up *Thunderbird* on Windows and imported my mail and contacts from *Outlook*. Then, I copied both the *Firefox* and *Thunderbird* profiles from C:/Documents and Settings/wsmith/Application Data/Mozilla to my USB thumbdrive (you could also burn them to CD or DVD if they're too big). With these profiles, I had everything I needed from Windows.

Back in Linux, I copied the profiles on my thumbdrive to the appropriate folders in my home directory. The *Thunderbird* profile goes into /home/wsmith/.mozilla-thunderbird and the *Firefox* profile goes into /home/wsmith/.mozilla/firefox. The next time I started either app, my Windows profile was present, without any hassles. (Note: A period at the beginning of a folder or file name means the folder or file is hidden.)

WINEing for Windows apps

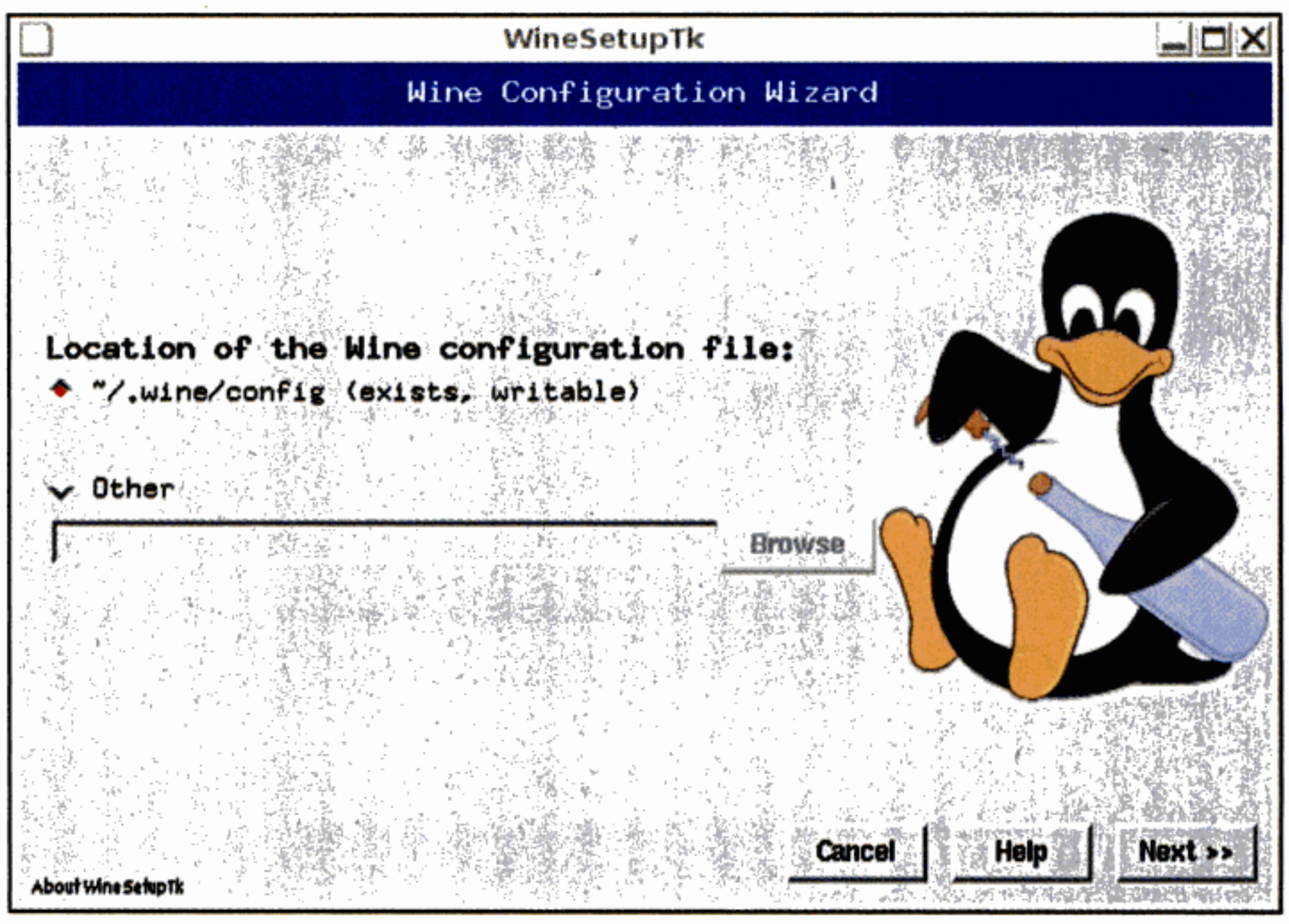
Once I installed the *Wine* package using apt-get, I had tremendous good fortune running Windows apps. *Wine* creates a fake Windows installation in the .wine directory under your home directory, where it stores installed files and any other Windows-specific files the app might need. The practical upshot is that to run Windows apps using *Wine*, all you usually have to do is install the app like you normally would, then double-click the *.exe executable file to start it.

Generally the more complex the app, the less likely it is to work, but many freeware and shareware apps do work. Apparently, with some tweaking, even Microsoft *Office* works. Check **www.winehq.com** for the full scoop.

Linux and games

Windows games are trickier to run on Linux than normal apps. They demand lower-level access to hardware, and frequently use features that just aren't present on Linux. There are basically two ways to play games on a Linux machine: using native, developer-supplied Linux executables or via emulation using a program called *Cedega*.

There are a surprising number of native Linux games available, including *Doom 3*, *Unreal Tournament 2004*, *NeverWinter Nights*, *Enemy Territory*, and *Quake III*. However, the vast majority of games don't ship with any form of Linux



***Wine* is a program that will let you run many common Windows apps on Linux. For those Windows applications that you just can't let go of, it's your only hope!**

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support out of the box. This is where Transgaming's *Cedega* steps in.

Cedega is like *Wine* for DirectX applications. Sadly, though, the reality is that gaming is a soft spot in Linux, and right now, playing games in this OS requires lots of tweaking.

Editing fstab to access USB drives

Once again, we're going to make a change to the fstab file. This time, we're going to add access to USB drives. The Linux kernel thinks that USB drives are really just plain-old SCSI drives, and we're not going to tell it otherwise. To get your USB drives talking to the Linux kernel, add a line to the end of fstab (remember, you'll need to be logged in as root to edit the /etc/fstab file) that reads:

```
/dev/sda1   /mnt/usb vfat rw,user,noauto,uid=yourusername 0 0
```

Save the file and exit kedit, but before you close the terminal window, you need to create the mount point that the USB key will connect to. Type `mkdir /mnt/usb`.

Now, when you want to connect a USB drive, all you need to do is open a terminal and type `mount /mnt/usb`. It's really that simple!

Java and Firefox

I spent the better part of my first month using Linux without seeing any Java applets at all, and I didn't miss much. Until I wanted to play *Bejeweled*.

To get Java working, I downloaded and installed the Java runtime from **www.java.com**. Then I went into the directory where my *Firefox* plugins were installed (/usr/lib/mozilla-firefox/plugins), and creating a **symlink**—the super-powered Linux equivalent of a Windows shortcut—to the appropriate Java plugin while I was logged in as root. For my install, the command was `ln -s /usr/java/j2re1.4.2_05/plugin/i386/ns610-gcc32/libjavaplugin_oji.so libjavaplugin_oji.so`, but the version number of the Java runtime will probably be different when you download it. ■

December 8
THE HAPPY ENDING?

I've been running a Linux box now for almost six months, and I have absolutely no regrets about switching over. I've been able to work in a fairly normal office environment with only a few easily resolved inconveniences. I've installed Linux on several of my home machines as well, and feel confident enough in my abilities that I intend to move my home server from Windows to Linux soon.

OK, so there are some things Linux just doesn't do well, and several of them have annoyed the hell out of me. Poor handling of clicked links between apps—I often clicked on URLs with no response—is the biggest annoyance, although that has improved greatly as *Firefox* and *Thunderbird* have matured.

Getting a PDA to sync is tough too. While Palm-based devices work fine, syncing a Pocket PC remains a formidable challenge. And the gaming situation is just plain ugly. Furthermore, trying to troubleshoot problems is very difficult, at least until you realize that detailed logs for all of your apps are stored in /var/log.

The bottom line is, for my work activities, there's no reason I'll ever need to switch back to Windows. My Linux box does everything I need to be productive, and I still learn new things every day.

The upshot is this: If you're even a little interested in Linux, give it a try. I highly recommend using a distro that doesn't hold your hand too much. You won't learn anything without a little adversity! That said, if you use a distro that ships with advanced package management systems—Debian's apt-get utility and **Gentoo's** emerge utility come to mind—you'll be able to focus on the big picture of learning Linux without worrying about whether you have the right version of **glibc** installed.

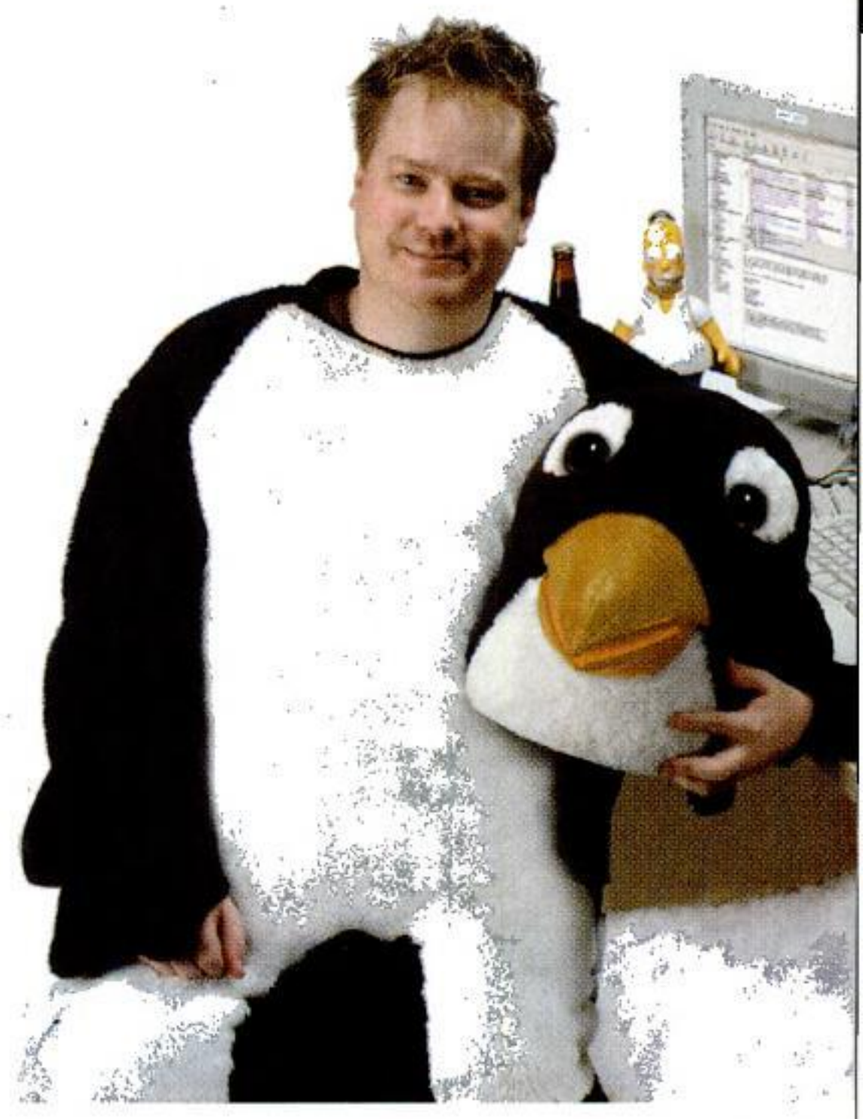
Finally, I'd like to thank the residents of *Maximum PC's* Alt-OS forum (**www.maximumpc.com/forum**)—special thanks goes to Jean-Paul "Jipstyle" Connock for checking my first draft of this story for serious Linux-related errors. The Linux gurus there helped me when I had problems and answered loads of stupid questions. As always, the golden rule to getting help with Linux applies: Read the damn manual before you ask questions—but the forum is a great resource for all beginners.

July 16, 4:37PM
iPods and USB keys
It took me a few hours to figure it out, but I managed to get both my iPod and USB key working. I can even sync my iPod with my music collection on the system using **gtkpod**. It's a hassle to make sure I connect all my external USB drives in the right order, but if I do it right, it works.

July 17, 5:15PM
Hardware still fails in Linux
D'oh! My hard drive conked out, taking with it everything I've worked on up to this point. Luckily, my home directory was stored on a different drive, so all I lost was the install, not my data. I should be up and running again in a few hours. This time, I'll do a better job with the knowledge I've picked up.

July 20, 1:50PM
Worms? Pfft!
Today an as-yet-unidentified worm got loose inside the *Maximum PC* office firewall and took dozens of PCs offline. But not mine. One of the best things about my entire Linux adventure is that I don't have to worry as much about all the viruses, worms, and spyware that plague Windows users. This is a classic example of security through obscurity; people simply don't write malware for Linux.

July 21, 12:29AM
Java and Firefox
It was a bit of a trick getting Java apps working inside *Firefox*, but I managed to get it done. I'm now beginning to consider myself a modern-day hero.



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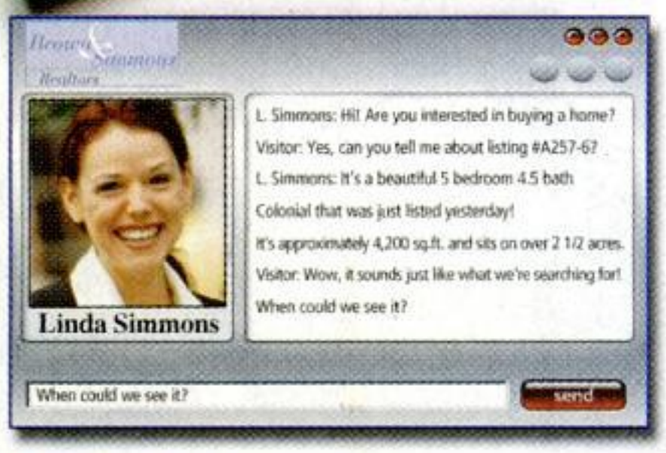
L. Simmons: Hi! Are you interested in buying a home?
Visitor: Yes, can you tell me about listing #A257-6?
L. Simmons: It's a beautiful 5 bedroom 4.5 bath Colonial that was just listed yesterday!
It's approximately 4,200 sq.ft. and sits on over 2 1/2 acres.
Visitor: Wow, it sounds just like what we're searching for!
When could we see it?
Linda Simmons
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Phone Number
877-461-2631
E-Mail
karen@karenanderson.us
Home Criteria
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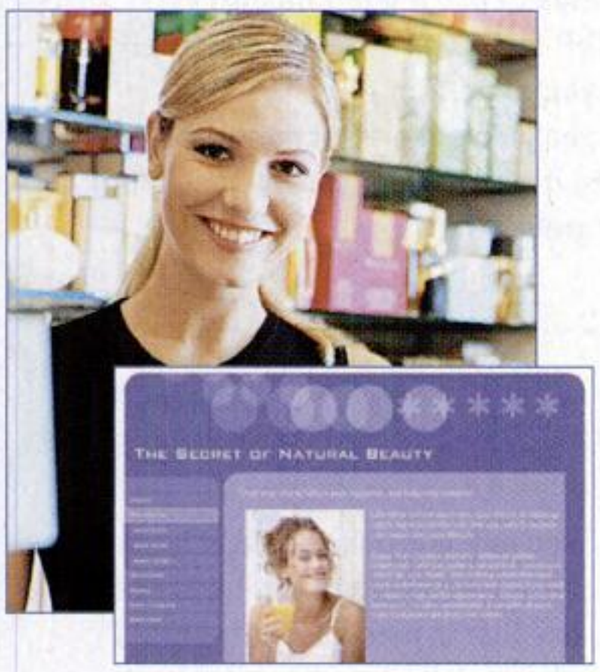

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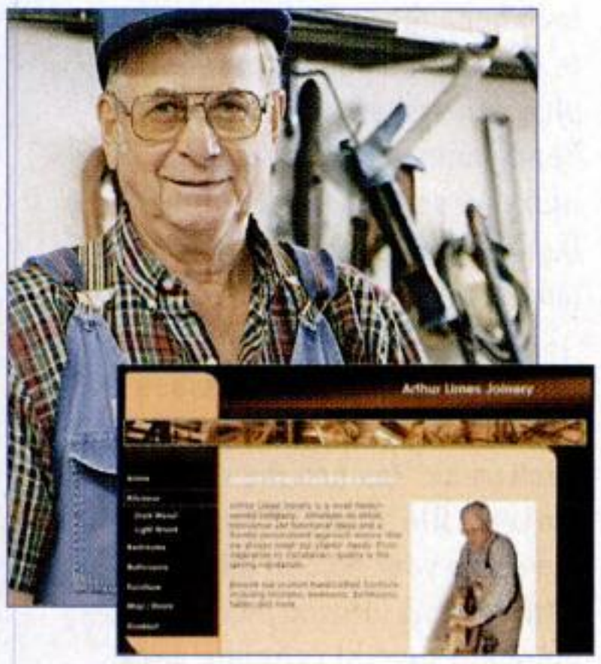

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Ask the Doctor

Symptom ▶ Diagnosis ▶ Cure

VEXING VIRUS

I'm running Windows XP. I installed *Norton Anti-Virus* and it detected a virus in my C: windows/system32/smrssm.exe file. The name of the virus is Backdoor.Cybspy and I can't delete it. How do I get rid of it?

—JOHN FRANKLIN

This one's a little tricky to get rid of. First, make sure your antivirus definitions are up to date. Run a full system scan and delete any files detected as the virus. Open RegEdit and delete the value MSWINCFG from the keys: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run and HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\RunServices.

Backdoor.Cybspy also deletes the file Netstat.exe, so if you use that, you'll need to restore it from your Windows XP disk. (You can restore missing or broken XP files by booting off the XP install CD and choosing "Repair Windows XP" when prompted.) This nasty bugger contains a keylogger, so you should definitely change all of your important passwords from a safe computer immediately.

WHEN MOBO MET USB

I recently built a new rig with an Asus A8V Deluxe mobo. Whenever I plug in my external USB hard drive, or boot or restart my PC with the USB drive plugged in, the BIOS automatically switches the boot drive to the USB drive. I updated the mobo with the newest BIOS version and the same thing happens. I never had this problem with previous mobos and no one seems to have an answer for me. Can you please help?

—SCOTT REIMER

The Doctor doesn't have that particular motherboard handy to test, but we do have a few tips you can try. Go into the BIOS and look for the boot options screen. Disable the option to "Boot other device." You should also move the USB drive to the back of the boot sequence when it's plugged in. This usually works better than removing the drive from the boot sequence.

Your last resort is to disable the option to boot from USB devices entirely. That will definitely solve your problem!

THESE FRAGS ARE PILING UP!

I just purchased *Diskkeeper Pro 8.0,* updated it to the latest version, and ran the program to defrag my hard drives. Unfortunately, with just 28 percent completed, I got a blue screen with the error: IRQL_NOT_LESS_THAN_OR_EQUAL, and my machine rebooted. I thought it might be a driver problem, so I updated all my drivers, as well as *PC-cillin,* which I had installed the day before. Is there a conflict between *PC-cillin* and *Diskkeeper Pro*?

—RUETZ300

The Doctor is not aware of any conflict between those two programs. However, it's not a bad idea to uninstall *PC-cillin* and see if *Diskkeeper* completes successfully.

It's much more likely that a failing hardware component is to blame. The error message you received is frequently associated with a faulty or failing RAM chip. Try pulling each chip in your system one at a time and running *Diskkeeper.* If it completes successfully with one stick, but not with another, you've pinpointed the culprit.

There's also a slim chance your hard drive is having problems. The Doctor recommends doing a full surface scan on the disk ASAP. You can do that by opening the run menu (Windows key + r) and typing `chkdsk c: /r` and rebooting.

TRAPPED IN THE PAST

I have tons of cassette tapes I'd like to transfer to CD, but my boom box doesn't have an RCA audio output. For that matter, none of the new cd/cassette boom boxes on the market have one either! How do I solve this problem using my desktop or laptop with my boom box?

—BOB MCELWAIN

You're boom box should at least have a headphone jack. You could use that to pipe audio to your PC via a patch cable—available at Radio Shack or another electronics store. If your boom box has a 1/4-inch headphone jack, make sure to also buy an adapter so you can plug one end of the cable into the headphone jack and the other end into your soundcard's smaller audio input jack (it's sometimes labeled Line-in).

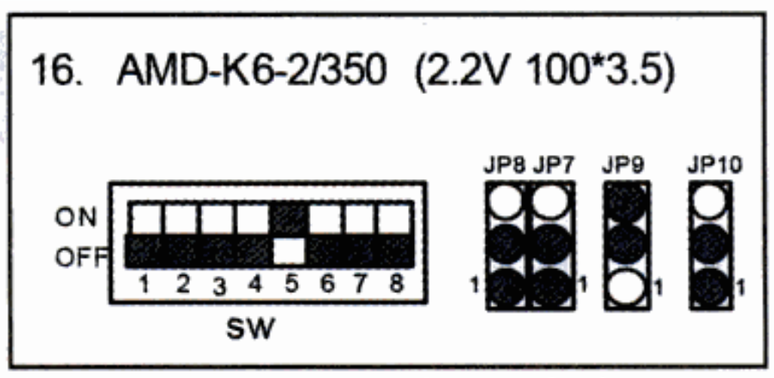
Once that's done, you can use *Sound Recorder,* which comes with Windows, to record a .wav files of each track. You can then compress the .wav file to an MP3 or WMA file using your normal jukebox app. If this seems like too much work, there are several software packages that will automate the process for you, but the Doc hasn't tested any of them enough to make a recommendation. You should download trial versions of a few different programs and see how they work.

GRUMPY OLD MOBOS

I just built a system for a friend using some older hardware I had lying around. It has an AMD K6-2 running at 350MHz, which I overclocked to 450MHz on a Gigabyte GA5AX mobo. I'm using Windows 2000, and *Sandra 03* reports the CPU running at a mere 225MHz. I tried another K6-3 400 and it's reported as running at half-speed also. I tried an old 233 MMX CPU and it also registers at half-speed. I noticed in *Sandra* that the frontside bus is 50MHz. Should I trash the board?

—GEO

Ahh, the old days of the K6-2 and Super Socket 7. Unlike modern motherboards, the Gigabyte GA5AX uses DIP switches to manually set the frontside bus and multipliers. To run at 350MHz, the mobo should be set to use a 100MHz frontside bus with a 3.5 multiplier. The Doc suspects you already know this as you're trying to overclock the CPU. The likely problem is that you simply have the switches set incorrectly—a problem that plagued even the Doctor back in the day.



Make sure you can clearly see the jumpers on your motherboard, or you're likely to set them incorrectly.

The Doc recommends that you download the mobo's manual from gigabyte.com.tw. A huge portion of the manual is devoted to the jumper settings for each CPU. For the 350MHz K6-2, the correct setting would be: switches 1, 2, 3, 4, 6, 7, 8 off and switch 5 on. JP8 and JP7 should have pins 1 and 2 jumped. JP9 should have pins 2 and 3 jumped and JP10 should have pins 1 and 2 jumped (see picture above for reference). It helps to use a good flashlight when you set the DIP switches so you can actually see which switch you're setting.

If the switches and jumpers are set correctly and the problem persists, it may be time to send that board to the motherboard graveyard.

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Additionally, using an amplified output to record audio isn't ideal, but if you tweak the volume level on the boom box, you should be able to get an acceptable recording. The Doctor doesn't think the quality level of the old analog tapes is high enough to justify spending more money on a cassette deck with line outputs.

MADDENING MONITOR MOVEMENT

I just moved and reconfigured the basement to be my office. The only problem is that both of my monitors (Viewsonic P810 and G790) have quite a bit of warble on the screen. They never did this in my old house. The only things anywhere close to the monitors are two A/C units outside the wall and two furnaces about 15 to 20 feet away.

The weird thing is, it doesn't matter if everything is turned off. The screen still shakes! I tried degaussing both of them, and tried a bunch of different resolutions and refresh rates, with no difference! Are there any other things to look out for, or is there any kind of extra shielding I could buy to protect the monitor?

—STEVE KLEIN

Visual distortion on a CRT's screen is usually the result of interference from another device. The interference could be electromagnetic in nature, meaning there's a buildup of magnetic radiation within the display or in its general vicinity, which deflects the electron beams and produces a distorted image, typically characterized by discoloration or a rainbow effect. Degaussing, which you've done, is one way to troubleshoot that problem. Another is to move your monitor to various locations, away from any potentially conflicting devices, such as speakers, fans, *or even another CRT.*

A "warble" seems more indicative of electrical interference. It's possible another device on the same electrical circuit is affecting the monitors; perhaps there are even line-noise problems in your new house. Plug the monitors into a different electrical circuit or isolate the monitors and your PC on a circuit by using a power protection device that includes line filtering—cheap surge protectors don't do line filtering, but most battery backups do. If that doesn't help, you may want to purchase a circuit tester (about $5 at Radio Shack) and check your outlets to make sure they are properly grounded.

If you didn't take electronics in high school or don't feel comfortable sticking a probe into your wall socket, you should probably call an electrician.

DVD HELTER SKELTER

I bought an All-in-Wonder 9600 Pro videocard and started recording video from the television and burning the programs to DVD. I found that the shows' audio was out of sync with the picture. I have changed burning software and editing software to no avail. How do I fix this problem?

—PMANNFURY

There's no easy way to fix audio/video sync problems once a video has been created. A utility like *VirtualDub* (free at www.virtualdub.org) can do it, but it can be challenging to use, so you'd *really* have to want to salvage that recording to make the hassle worth your while.

Preventing the problem from occurring in the future is another matter. Believe it or not, the most likely culprits are a drive that's too slow or heavily fragmented, or too many background applications running during recording (especially file-sharing applications that continually lean on the hard drive). Make sure to shut file-sharing apps before you begin recording, and defrag your hard disk regularly.

You might also consider recording to a hard drive partition that's not frequently accessed, or better yet, a separate physical hard drive altogether. A 7,200rpm hard drive is the bare minimum we'd consider for video capture. They're cheap enough these days to add a second drive dedicated solely to vidcap.

DO EMULATORS DREAM OF COPYRIGHTED SHEEP?

I purchased *Doom 3* and *Call of Duty: United Offensive* from Activision. When I try to run these games, I get a notification that I have CD emulation software running. Inspection of the Device Hardware section of the Control Panel indicates none installed. I've had emulation software installed in the past, but not currently. Any idea what is left in my machine that's tripping the copy protection software into thinking I have that software installed?

—STEVE GRAFLUND

The Doctor appreciates your restraint, Steve. Usually, these letters read more like *"I PAID for this #$&@! game and the @$#&! won't @*$#! work. Damn them all to hell!"* and so on.

You didn't mention which CD emulator you had installed in the past. If it was *Daemon Tools*, try reinstalling and then uninstalling the application to remove any detritus that may have been left behind by a prior uninstallation. If this doesn't work, go to www.daemon-tools.cc, and on the home page, click Daemon Tools Help (to the left of the screen). Then click Uninstallation, and follow the instructions to manually remove the application.

If you've ever used Ahead's *Nero ImageDrive*, you'll have to completely uninstall the application and reinstall it again without activating *ImageDrive*. That's right—even if you've disabled *ImageDrive*, using it even once installs a driver that Activision's copy-protection doesn't like.

Activision's support page (www.activision.com) offers uninstallation advice for some programs.

In the Doc's opinion, this heavy-handed approach to copy-protection only punishes the consumers who actually buy the game, without even slowing down pirates. It's maddening that the legitimate software still refuses to operate *even when CD emulation is disabled.* Unfortunately, the only recourse is to vote with your wallet and return games to the store that purchased them if they won't install on your machine. ■

POWER FOR THE LOW-POWERED!

I've been trying to determine which USB flash drives can be used in low-power USB ports such as the ones found in keyboards. Even after I open the package, I can't find anything stating the power requirements for the device. How do I find this out?

Getting a USB 2.0 flash drive to work on an unpowered hub, such as a keyboard, isn't likely to happen.

We'd also love to be able to stick our 2GB USB key into the port on our keyboard, but that just ain't gonna happen any time soon. The port on your keyboard simply doesn't provide enough juice. According to M-Systems (maker of DiskOnKey and a huge player in the flash-based drive market), most USB 2.0 drives consume more than the 100mA of power that unpowered hubs typically provide. That means the devices are only guaranteed to work on powered hubs and ports connected directly to your motherboard.

In fact, any USB 2.0, high-speed, bus-powered device needs a powered hub to operate. Low-speed USB 1.1 drives are considered low-power devices, and as such, will work just fine in unpowered hubs. In testing, we've had moderate success getting low-capacity USB drives (256MB and below) to work on unpowered hubs, though the results vary. In tests of every 1GB drive we have, only one was able to work in an unpowered hub.

Our advice: Stay away from lowly USB 1.1 devices, and either get a USB extension cable you can connect to the back of your PC, or get a USB 2.0 hub that you can plop down on your desk for quick access.

A really silly man once said, "Love is like a flightless bird in the eye of a hurricane." Frankly, the Doctor doesn't have any idea what this means, but he does know a thing or two about fixing computer problems. Send an e-mail to **doctor@maximumpc.com** to get a healthy dose of the Doc's advice.

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How To...

A step-by-step guide to tweaking your PC experience

Build a really, really, really SILENT PC

We assembled a Pentium M-based rig with a fanless power supply, and ended up with the quietest air-cooled PC we've never heard

BY GORDON MAH UNG

MAXIMUM PC
TIME TO COMPLETION
03:00
HOURS MINUTES

There are times in life when your PC's noise level doesn't matter—frinstance, when your college roommate complains your computer is too loud. (Too loud? Deal with it, Kirby, Mr. "Who the Hell Drank My Last Mango Madness Snapple," complaining-ass punk.)

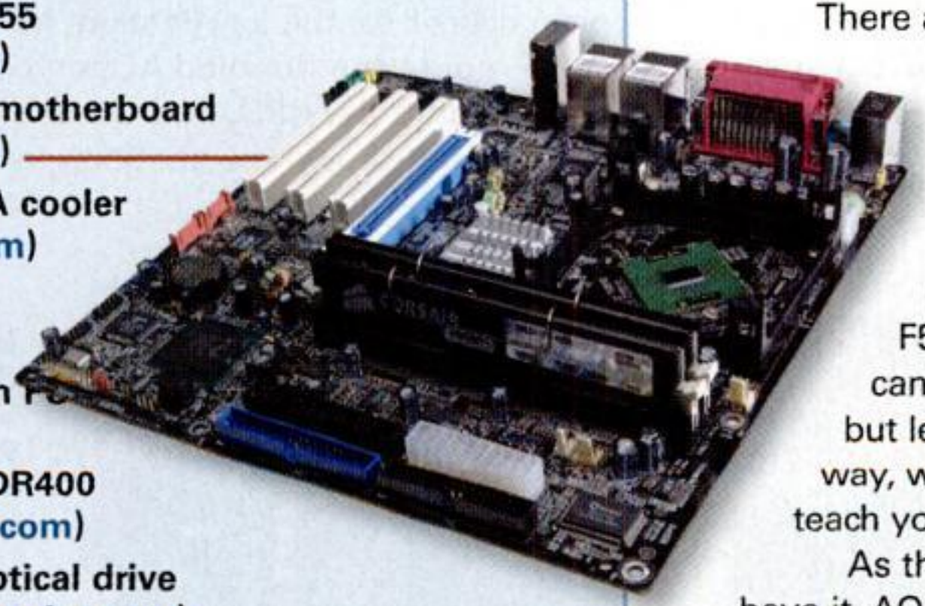
But, hey, we're not all dorm-rats, and sometimes silence is indeed necessary. Does your cat run underneath the bed whenever you turn on your rig? Does your pregnant wife complain more about fan volume than rocket-launcher volume? You, friend, need a quiet PC.

When conceiving this step-by-step, we wanted to avoid heroic—and expensive—silencing measures, such as water cooling or the use of a specialized case. We were also determined to avoid performance sacrifices. And so, in our battle against Hoover-like sound levels, we focused our attention on traditional PC parts expressly designed for cool, quiet operation. We chose products that require less cooling than competing hardware, which in turn allowed us to install fewer fans, and run slower fan speeds than what would normally be considered safe.

For the sake of this how-to, we're going to assume you've built a system before, and we'll only be highlighting steps that are specific to the construction of a quiet PC. Now, if you haven't built your own PC before, don't fret. Head to the reprints section of **www.maximumpc.com**, and look for the Build It feature, which walks you through every step of building your first PC.

Ingredients

- Intel 2GHz Pentium M 755 ($440, www.newegg.com)
- AOpen i855GMEm-LFS motherboard ($275, www.newegg.com)
- Zalman VF700-AICu VGA cooler ($40, www.zalmanusa.com)
- Antec TriCool fan ($20, www.antec.com)
- Antec 350 watt Phantom P[illegible] ($175, www.antec.com)
- 1GB of Corsair Micro DDR400 ($200, www.corsairmicro.com)
- Pioneer DVR-A08XLA optical drive ($150, www.pioneerelectronics.com)
- 160GB Seagate Barracuda 7200.7 hard drive ($115, www.seagate.com)
- Smart Drive 2002 hard drive enclosure ($55, www.endpcnoise.com)
- Antec SLK3700-BQE case ($100, www.antec.com)
- Floppy drive ($10, generic)
- Arctic Silver 5 thermal paste ($8, www.arcticsilver.com)
- Akasa Paxmate sound dampening material ($20, www.akasa.com.tw)



1 Pick Your Configuration

There are two ways to build a silent PC. One is to click "buy" at Voodoo PC's web site and pick up a fanless F50 system. Or you can do it the harder, but less expensive way, which is what we'll teach you here.

As the fates would have it, AOpen just began offering a unique motherboard that's perfect for this project. The i855GMEm-LFS is a micro-ATX desktop mobo that makes silent computer-lovin' with Intel's Pentium M notebook CPUs. Also known as Centrino, the Dothan-based version of the Pentium M has a rep for being fast and relatively cool (at least compared with desktop processors), which makes it perfect for our project. We chose a 2GHz chip, which gives 3.2GHz P4 Prescotts a run for their money in some productivity tests.

For 3D chores, we filled the AOpen's AGP slot with a GeForce 6800 GT card from Asus. To shush this card beyond its basic out-of-the-box quietness, we replaced the stock cooler with a Zalman VG700-AICu VGA Cooler. Finally, we decided to address the annoying racket that's typically produced when optical drives spool up. Our solution was Pioneer's DVR-A08XLA, the quietest double-layer dual-format DVD drive we've tested to date (it even features a special honeycomb pattern in its frame, which supposedly reduces the din of operation).

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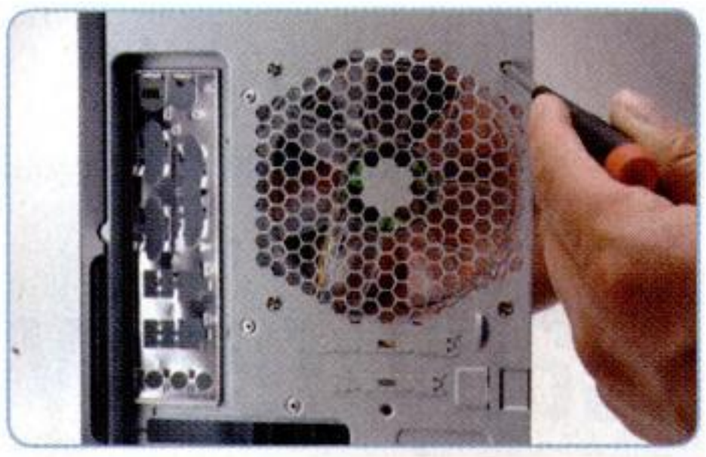
2 Prep the Case

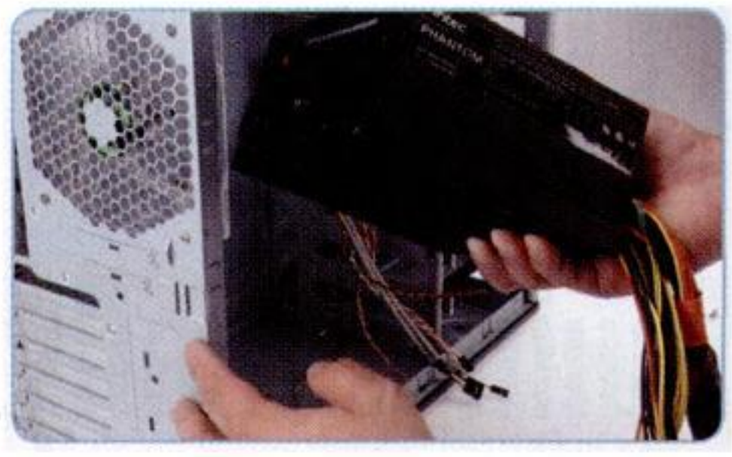
The Antec enclosure used for this project came with a Smart Power PSU, which we swapped for Antec's fanless Phantom PSU (both are spec'd at 350W). Begone, noisy power supply fan, begone!

We also 86ed the case's stock 120mm fan. Why? Because the stocker fan runs off a standard peripheral power connector that doesn't let you vary the fan's RPM. That's no good, because we know that large fans running at low RPM produce less noise than small fans running at high RPM. Our add-in fan of choice was a 120mm Antec TriCool, which can be toggled between three RPM settings, and can run off a peripheral power connector or a three-pin mobo outlet. For this project, we chose to plug the TriCool into the mobo connector so we could further fine-tune its speed through the motherboard BIOS or OS.

While you're prepping the case, you should also install the rectangular metal I/O shield that comes with the motherboard.



We replaced the case's stock 120mm fan with an Antec TriCool, which lets you manually adjust fan speed.

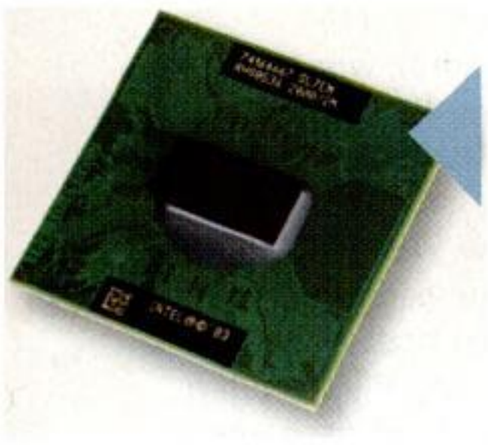


Replacing the case's stock PSU with Antec's amazing fanless PSU (the "Phantom") eliminated about half the noise the system would otherwise make.

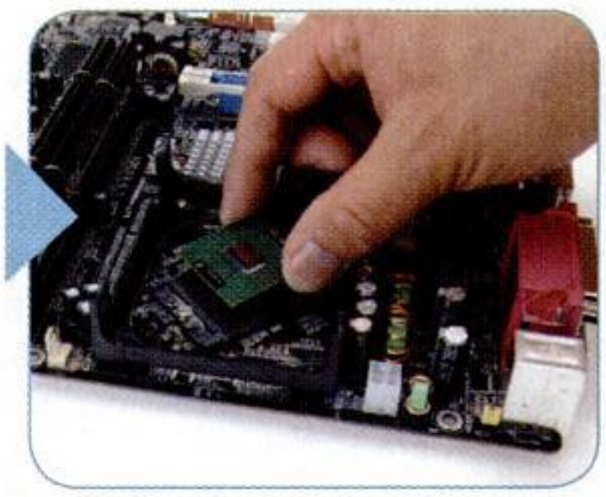
3 Prep the Motherboard

Lay the motherboard on a nonconductive surface, such as the top of the box it came in, and take all the other antistatic precautions you learned in PC Building 101. The Pentium M is built for notebook PCs featuring custom heat pipes, so when you open your processor's packaging, you'll find no heat-spreader protecting the CPU's core. Therefore, it's imperative you exercise extreme caution when holding the CPU and mounting the heatsink.

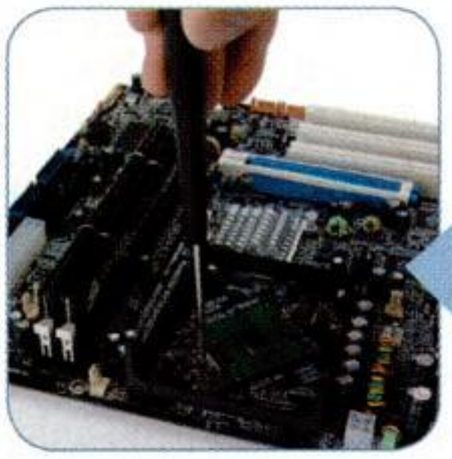
Your mobo's CPU socket should be unlocked, but if it isn't, simply use a flat-head screwdriver to turn it counterclockwise until it stops. Now, gently insert the CPU and once you're confident it's sitting firmly in the socket, use the screwdriver and turn clockwise until the CPU locks in place. As for memory, we installed 1GB of Corsair Micro DDR400. DDR400 is overkill for a chipset that only runs at DDR333 speeds, but at least we can run extremely low latencies with the Corsair modules.



Check out the big brain on Brett! The 144 million transistors in the Dothan-cored Pentium M are exposed to the world, so use extreme caution when handling and installing this baby. He ain't no regular CPU!



Get the pins right. Make sure the CPU is correctly oriented before you insert it into the CPU socket, or you could end up with horribly bent hardware.



Lock it in. Once you're certain the CPU is sitting flush in the socket, use a flat-head screwdriver to lock the chip in place by turning the locking screws clockwise.

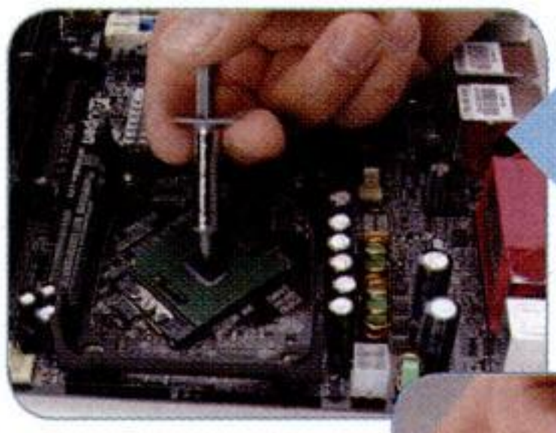
4 Mount Up

The motherboard comes with a bit of generic heatsink paste, which we trash-canned in favor of Arctic Silver 5. When using the Arctic Silver 5, apply a dab just half the size of a BB to the core, and smooth it using your finger in a plastic bag.

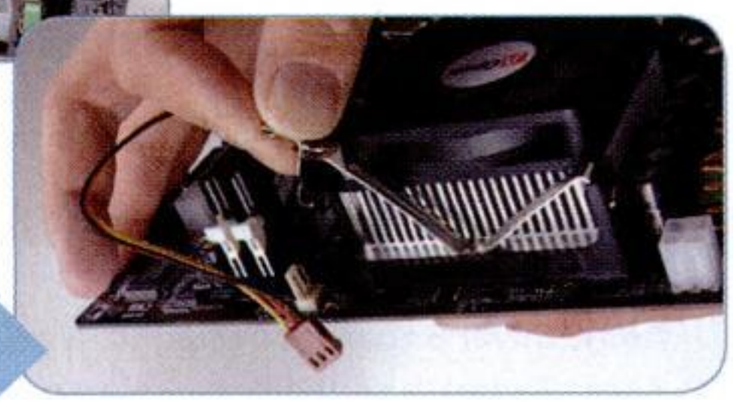
The AOpen board also comes with a small CPU cooler designed for the Pentium M. We recommend you use it. Here's the deal: The Pentium M family is spec'd for Socket 479, not Socket 478, which has been designed for desktop CPUs bearing integrated heat spreaders. If you attempt to use an aftermarket Socket 478 cooler on your Pentium M, you'll be stuck with a gap between your heatsink and CPU—and that's the best-case scenario. The worst-case scenario is that you'll clamp down too hard with your aftermarket heatsink, crack the CPU core, and *adios muchacho*.

So use the bundled cooler. That said, we can tell you that we successfully mounted a massive Zalman CNPS7700-Cu on the processor. This heatsink allows you to manually adjust ride height and tension, so it will work. In the end, however, we ended up going back to the stock AOpen heatsink because the Zalman was just plain overkill for the tiny Pentium M.

To mount the bundled AOpen cooler, carefully lower it directly onto the CPU, and use the two clips to lock it in place. Now mount the whole shebang in the case as you would any other motherboard.



Use just enough Arctic Silver 5 to form a thin layer across the top of the CPU. A finger inside a clean plastic bag can be used to spread out the compound.



The motherboard comes with an aluminum heatsink that doesn't look like it would keep an Athlon XP cool, but at just 21 watts when maxed out, the Pentium M doesn't need much cooling.

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5 Prep the Videocard

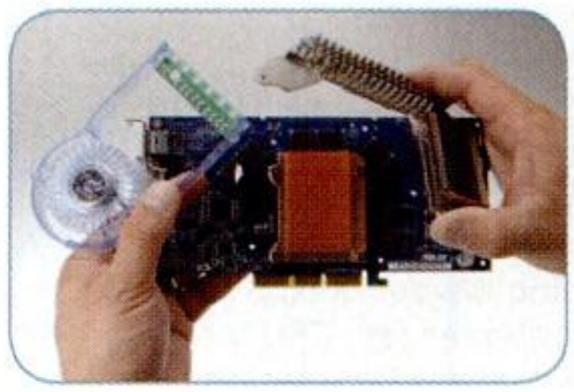
If your videocard is already quiet enough for you, and you have no desire to change its cooler, skip ahead to step 6. If not, follow our lead.

We selected a mid-grade Asus GeForce 6800 GT card for our rig. It has more than enough power for today's games, and isn't saddled with the thermal requirements of its big brother, the GeForce 6800 Ultra. The stock fan on our card was a tad shrill, so we replaced it with a Zalman VF700-AlCu VGA cooler.

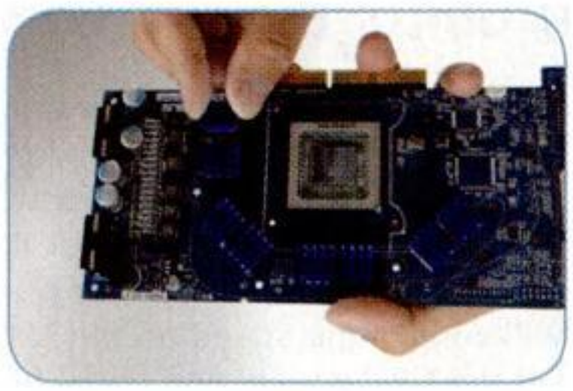
To disassemble the stock heatsink, you'll need a good set of small screwdrivers. On the rear of the card, remove the screws that hold down the RAM heatsink and fan. Put the screws in a safe place (like an old film container), and then flip over the card and remove the smaller set of screws from the fan cover. This will reveal another set of screws that will have to be tackled in order to remove the actual copper heatsink from the card. Of course, different removal procedures will apply to different cards, but keep in mind that the VF700-AlCu VGA cooler only works with single-slot cards that have mounting holes for the fan. (Zalman also makes a fanless cooler for videocards, but it doesn't cool a card's memory, and we think our 6800 GT needs the memory airflow.)

To apply the Zalman VGA cooler, you should follow the instructions included with it and take a look at our pictures to help clarify some of the steps.

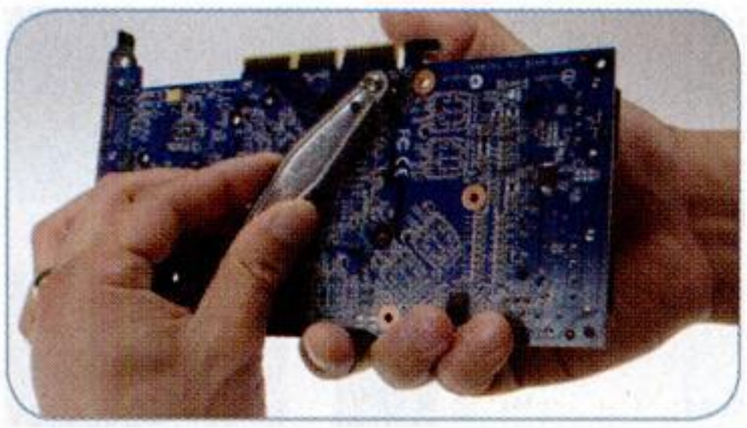
To remove the heatsinks from the videocard, start by unscrewing all of the screws on the back



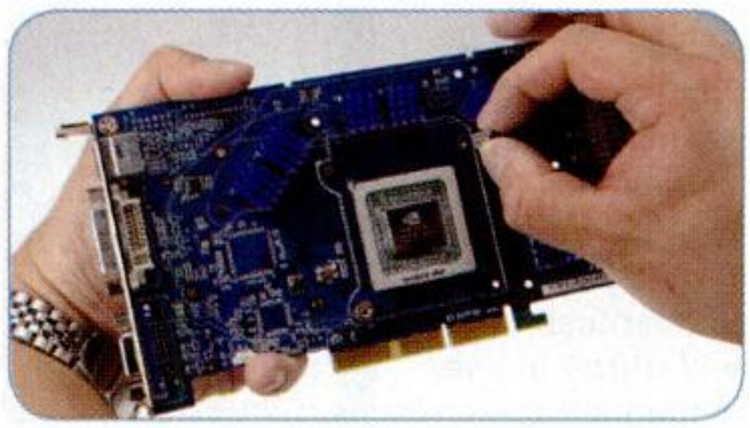
Flip over the card, remove the tiny set screws that hold the cover in place, remove all of the visible screws, and gently remove the RAM heatsink and assembly.



The Zalman VGA cooler we decided to use comes with RAM heatsinks that mount to the individual chips using thermal tape.



After you attach the nipple spacers to the metal brace plate, add O rings to it, and gently push it through the back of the videocard.



With the metal brace placed through the back of the card, put the O rings onto the two screws sticking through the card and screw the last two nipples onto the card.

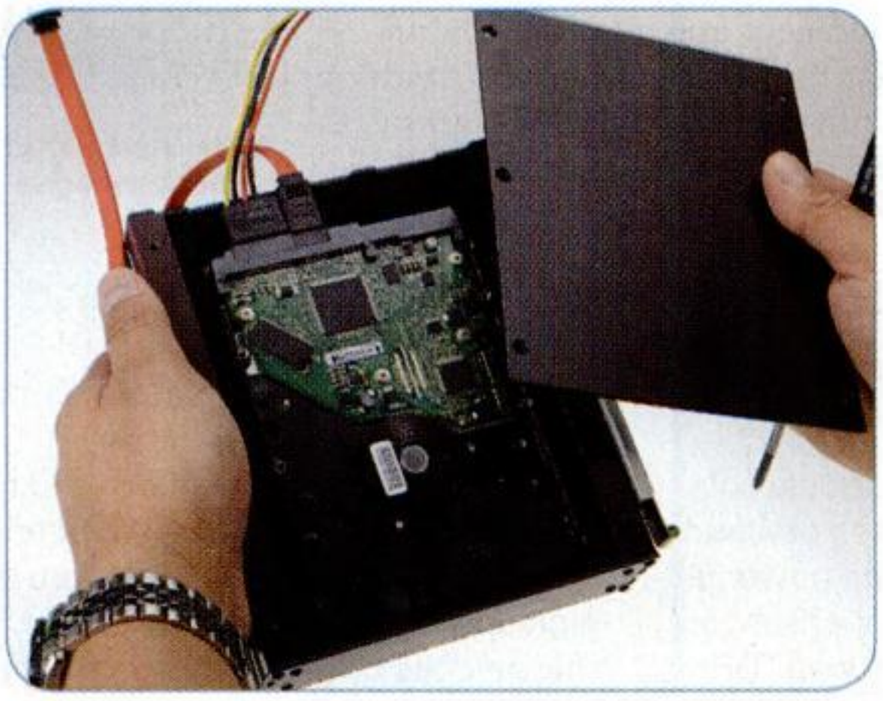
After you've applied Arctic Silver 5 to the GPU core, mount the VGA cooler to the two nipples using the final two screws in the package. Make sure both are on tight so they don't back off and let the VGA cooler flail about.

6 Quiet the Hard Drive

Hard drive chatter can be annoying, so we decided to dampen the sound with a Smart Drive 2002 from GUP. These little enclosures can be hard to find, but they're worth the search, as they can muffle most of an HD's noise. Enough to quiet a 10K Raptor? Well, no, so we swapped out our config's Raptor drive for a Seagate Barracuda 7200rpm drive with fluid bearings. Our Smart Drive 2002 is made from aluminum instead of copper (which is what the new version uses), but it worked just fine.

To install your HD in the enclosure, remove the screws from the bottom of the Smart Drive and pop off the bottom plate. Attach the SATA data and power cables to the hard drive, and then run them through the rear of the enclosure. Put the bottom plate back on, and screw it shut. If you want, you can now install the drive enclosure and the Pioneer optical drive.

We found that even the quiet Barracuda seeks were audible every now and then, so we added a strip of Akasa Paxmate on either side of the drive cage to help dampen the sound even further.



Our Smart Drive 2002 enclosure was actually made for PATA drives, but it works fine with SATA drives too. If you use the SATA power adapter that comes with the mobo, you don't have to keep the enclosure hooked up to the power supply.

7 Plug in Fans

There are three fans you have to account for in this system. We plugged the Antec 120mm into the SYSFAN1 connector between the CPU and the rear I/O ports. The CPU fan should go into the CPU plug, and the VGA cooler should be plugged into the third power plug on the motherboard located just next to the main power connector. If you're not using the fans we used in this how-to, make sure the fans don't draw so much power that you overload the motherboard.

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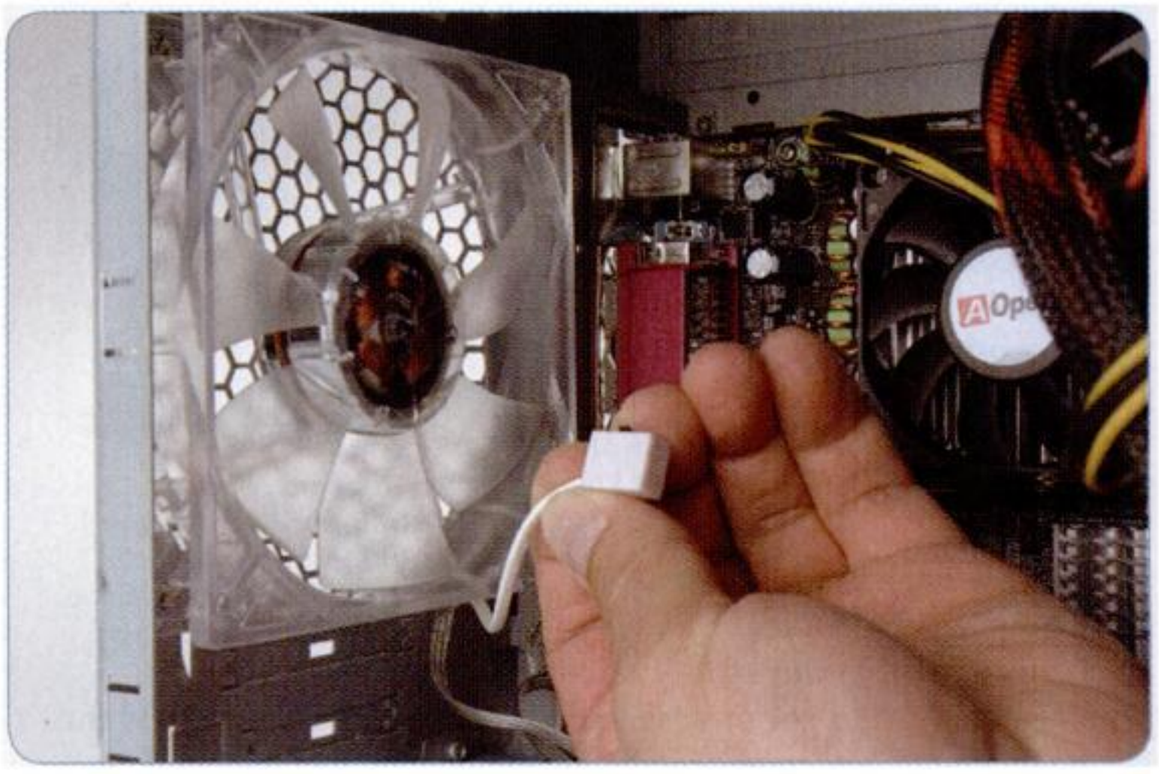
8 Configure the Fans

The AOpen mobo lets you manually configure your fan speed from within Windows XP or from the BIOS. We opted for BIOS control. To set the speeds manually, reboot the machine, enter the board's BIOS, and look for the Silent BIOS category. If you followed our instructions for plugging in your fans, SYSFAN2 will control the speed on the 120mm Antec fan, CPUFAN will set the CPU speed, and PWRFAN will control the fan on the VGA cooler. Change the fan mode from Full Speed to Fixed Speed. You can now set each fan's speed manually.

We found that setting the PSU fan to 66 percent, the CPU fan to 60 percent, and the VGA cooler to 26 percent gave us a good balance between heat dissipation and noise production. Because the Antec TriCool fan lets you manually select between three fan speeds, we set it on its lowest speed. This eliminates the whoosh noise when the system is turned on or rebooted.

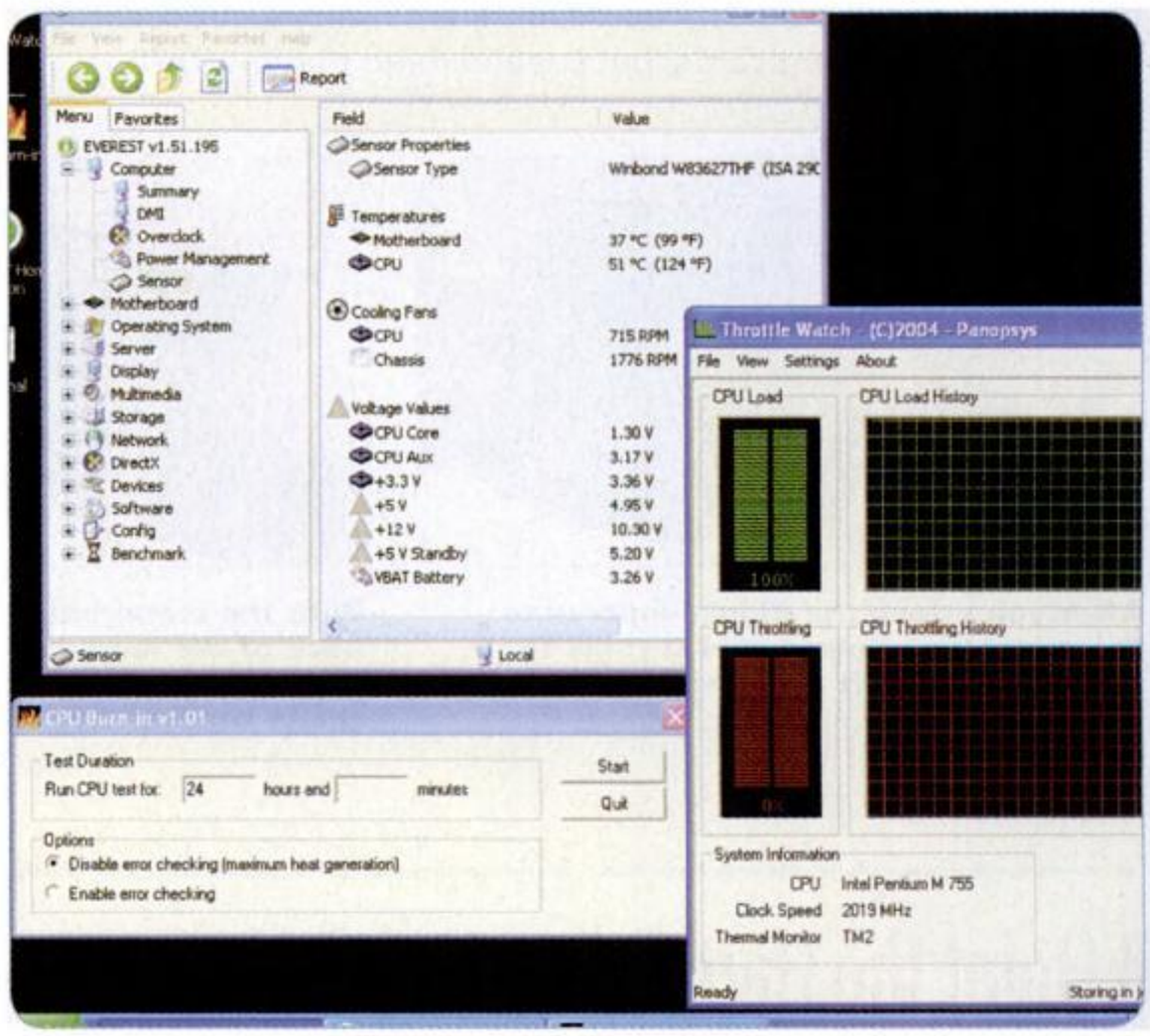


By setting the 120mm fan to its low speed, we prevented the typical whoosh noise that occurs when you reboot or turn on the computer.

9 Test Your Configuration

Because you're running the thermals near their ragged edge, you'll want to make sure you're not overheating the machine. If your machine is absolutely silent, it does you no good if it crashes constantly. We grabbed a copy of *ThrottleWatch* from **Panopsys.com**. This utility lets you monitor your CPU load and, more importantly, monitors P4, Pentium M, and Xeon chips for the frequency-reduction that occurs during overheating (when overheating is detected, your system will trigger these chips' built-in protection and throttle down frequency speed to prevent damage).

We also suggest you use a CPU-intensive program such as *CPU Burn-in* (**http://users.bigpond.net.au/cpuburn/**) to put a load on your processor for a few hours. You should test your system with the case door on, which is how you'll be using it. We also used *Everest Home Edition* (**www.lavalys.com**) to monitor the CPU sensor temp. If your box is throttling down CPU speeds, you'll have to bump up your CPU fan speeds until it stops. Also consider running a 3D-intensive app such as *3DMark 2003* to see if you can overheat the videocard. FWIW, with our fan settings, we were able to run both *3DMark 2003* and *CPU Burn-in* overnight without video corruption or crashes. ■



We used *ThrottleWatch, CPU Burn-in,* and *Everest Home Edition* to check whether we had set the fan speeds too low.

What We Learned

The Pentium M 755 is an amazingly cool and fast CPU. Even at 2GHz, the processor's maximum thermal design power is 21 watts. (For the sake of comparison, a 3.4GHz Pentium 4 550 is a 115 watt TDP processor.) While the Pentium M might consume just 21 watts, it's not a weak processor. On the contrary—it's quite fast and gives many desktop processors a run for their money. Unfortunately, we can't say such nice things about the Pentium M's expensive Intel 855 chipset series, which seems antiquated today. The 855 supports DDR333 as its fastest memory and maxes out at 4x AGP, and its ICH4 south bridge doesn't have native SATA support, nor a high-speed interconnect. Of course, the chipset does offer a host of power-saving features, but these have little application on a desktop machine.

We definitely see some use for desktop boards like the i855GMEm-LFS, and hope AOpen continues to explore the category. We see a need for a full ATX version, and we've already recommended a few BIOS tweaks to make the board even better suited for silent computing. If we had to do the project over again, we'd probably go with a 5400rpm hard drive to cut even more noise. Even with the drive enclosure, the seeks were a tad audible. The Smart Drive 2002 did work, but we're a little unhappy with the build quality of the unit.

And now for the question you've all been waiting for: How quiet was it? Pretty damned quiet. We knew we had accomplished our goal when several editors asked if the PC was running.

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and let the games begin.
The GOLD Standard
in the unforgiving world of gaming.
This keyboard is a powerful tool
ablaze with weapons other boards can't handle.
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metal diamond plate bottom pan.
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but begs to be split open
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In the Lab

A behind-the-scenes look at Maximum PC testing

Apple's 30-inch Cinema Display

We do what it takes to run Apple's new proprietary high-res LCD on a PC. Is it worth it?

Apple's gorgeous 30-incher is a tough sell for PC users, given its unusual videocard requirements.

Since its introduction, Apple's new 30-inch Cinema Display has had PC users in a lather. It's no wonder; with a native resolution of 2560x1600, this display is unparalleled by any other consumer offering.

But unlike the 20-inch and 23-inch Cinema Displays, Apple's biggest and best doesn't readily lend itself to use with a PC. The $3,300 30-inch monitor requires a special videocard, which Apple itself builds exclusively for its own computers. Based on the GeForce 6800 chip, Apple's board features a unique Dual Link DVI controller—the key to the new Cinema Display's ultra-high native resolution.

Dual Link technology raises the ceiling on DVI bandwidth by using two DVI transmitters to feed a single monitor through one cable. (Interestingly, the maximum resolution for Dual Link is spec'd at 2048x1536 at 60Hz, which the Cinema Display somehow surpasses—we suspect the clock speeds are lowered even further to hit the full res for the monitor.) Unfortunately, neither ATI nor nVidia builds consumer videocards for monitors that require Dual Link, and neither company plans to implement the technology in the foreseeable future.

Still, PCs aren't entirely shut out from the 30-inch Cinema Display. Matrox, ATI, and nVidia all make workstation boards with Dual Link. Of course, those boards cost a bundle—$1,000 or more—and are optimized for professional applications like CAD rendering, not desktop gaming. Regardless, we got our hands on an nVidia Quadro FX 4000 so we could see what this mondo Cinema Display is all about.

It's impressive, for sure. All that screen, all that detail. Compared with the 30-inch Westinghouse on page 74... well, there is no comparison. The Cinema Display is clearly a superior computer monitor. We ran the *DisplayMate* (**www.displaymate.com**) utility we use in all our display reviews to examine the CD's finer points, and it withstood the rigors of every evaluation script, save the screens that test high-frequency content—namely, fine vertical detail. Granted, we couldn't distinguish related flaws in real-world use, but it's worth noting.

Nevertheless, most PC power users would be loath to buy a display this grand if it couldn't meet the demands of gaming. To test it, we first ran *Need for Speed: Underground*. At a paltry 1024x768 resolution—the maximum allowed by the game—the Cinema Display performed no better or worse than the best LCDs we've reviewed over the past year. To further experiment, we ran *Half-Life 2*. Here the Cinema Display was free to run its sky-high native res, and we were duly impressed with the speedy pace of gameplay. But while the content on the screen looked amazing, water—which is prevalent throughout the game—was a no-show on the Cinema Display, suggesting other potential problems using the Quadro board. Switching to nVidia's desktop drivers did nothing to improve matters.

Finally, we tested the Cinema Display's prowess with various video files. Full-motion content of various formats looked great—from any angle!—but we couldn't view any video full-screen without distortion. At a range of resolutions, the problem consistently manifested when the video was stretched to near full-screen. Again, we suspect the fault lies with the Quadro or its drivers. When hooked up to a Mac running the Apple-built videocard, the Cinema Display exhibited no such problems.

In the end, as much as we appreciate the Cinema Display's screen size and advanced specs, it's simply not a practical option for the majority of PC users.

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SureFire L2

The SureFire L2 gives off a beautiful white light without the disturbing shadows cast by those $8 jobbies.

Tiny jumpers. Dropped screws. Out-of-the-way connectors. All can be pretty difficult to find inside a PC with cheapie AA flashlights, which project more shadow than they do light. SureFire's new L2 LED-based flashlight is the perfect companion for wrenching on a PC. Lightly press the flashlight's rear cap, and you'll be treated to 15 lumens of pure white light. The light pattern is beautifully shaped and dispersed without any distracting shadows and drop outs. Add a little more pressure to the tail cap, and the L2's output kicks up to a blinding 100 lumens—more light than is produced by a four-cell D flashlight and exceedingly useful for finding a lost screw under a sofa or seeing your way out of a building during the next East Coast blackout. The L2 uses top-shelf Luxeon LED bulbs that can't be broken or burned-out even under rigorous use, and its body is constructed of Milspec hard anodized aluminum. It may be expensive, but you certainly get what you pay for. **$165, www.surefire.com**

Best of the Best

As of February 2005

There are few hardware changes from January but we've decided to close-out a few categories. In the do-everything videocard space, ATI's All-in-Wonder series has been the top pick ever since the category was created. It seems that nVidia has just given up, so there's really no other choice. Likewise, Creative Labs' 7.1 speakers are the only 7.1s we know of and that's unlikely to change, so if you gotta have 7.1, make 'em the Gigaworks S750. We're also closing out parallel ATA drives and creating 10K RPM and 7.2K RPM categories. Even though we've reviewed just one PCI-E Athlon 64/FX motherboard, we're going to recommend it as we know people just can't wait any longer. And while we're awaiting the arrival of more PCI-E videocards, we strongly recommend you refrain from investing in AGP. Likewise, we should be able to settle the LGA-775 score with an upcoming three-board 925XE review roundup we have planned.

High-end AGP videocard:
nVidia GeForce 6800 Ultra

Budget videocard:
ATI Radeon 9800 Pro

Do-everything videocard:
All-in-Wonder Radeon 9800 Pro

Soundcard:
Sound Blaster Audigy 2 ZS Platinum

10,000rpm SATA:
Western Digital 740GD Raptor

7,200rpm SATA:
Maxtor DiamondMax 10 300GB

DVD burner:
Sony DRU-710A

Widescreen LCD monitor:
Hewlett-Packard f2304

Desktop LCD monitor:
Dell 2001FP

Desktop CRT monitor:
NEC FE2111 SB

S939 A64/FX Mobo:
Asus A8N-SLI Deluxe

Portable MP3 player:
Apple iPod 40GB

Photo printer:
Canon i9900

Pocket PC PDA:
Dell Axim X50v

Palm OS PDA:
Palm Tungsten C

5.1 speakers:
Logitech Z-5500 Digital

4.1 speakers:
Logitech Z-560

2.1 speakers:
Klipsch GMX A-2.1

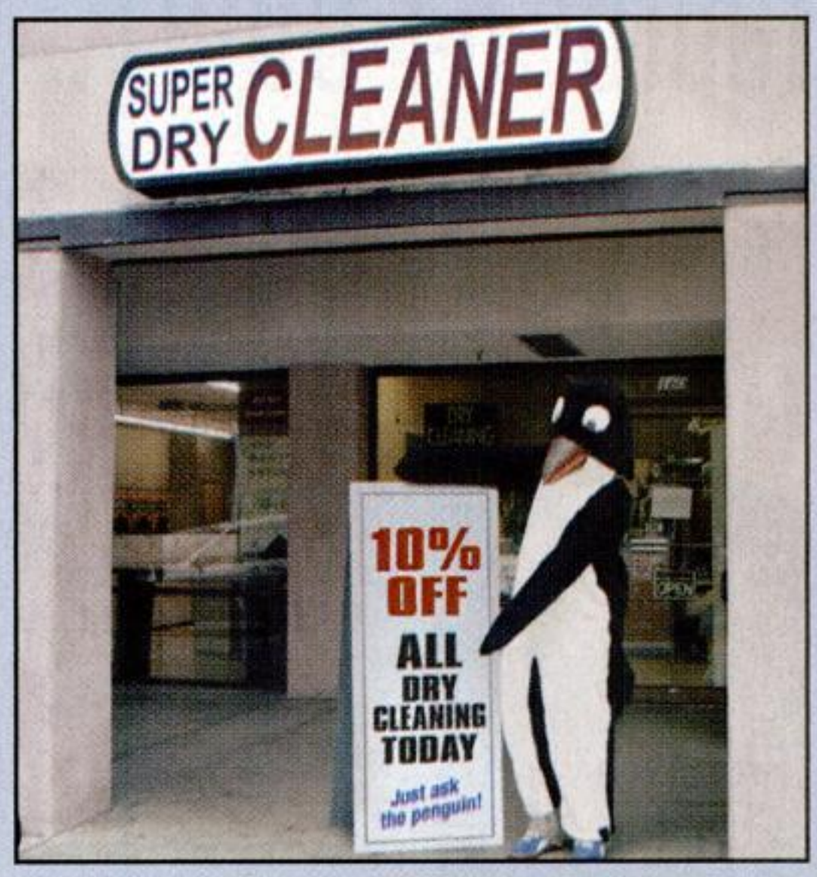
Analog headset:
Sennheiser PC-150

USB headset:
Plantronic DSP-500

Our current gaming favorites: *The Battle for Middle Earth, Worlds of Warcraft, Half-Life 2*

Living La Vida Pengua

Technical Editor Will Smith enjoys using Linux so much, he has wholeheartedly adopted the penguin lifestyle. While, there are advantages to this new mode of being, he's found out the hard way it's not as glamorous as it seems in the movies.



The best part of being a flightless bird? Lucrative sponsorship deals mainly. The 10 percent discount on dry cleaning comes in handy too.

So, if penguins can't fly, they have to drive, right? Wrong. Not only is the speedometer obscured by his beak, but the steering-wheel design reveals an "anti-flipper" bias.

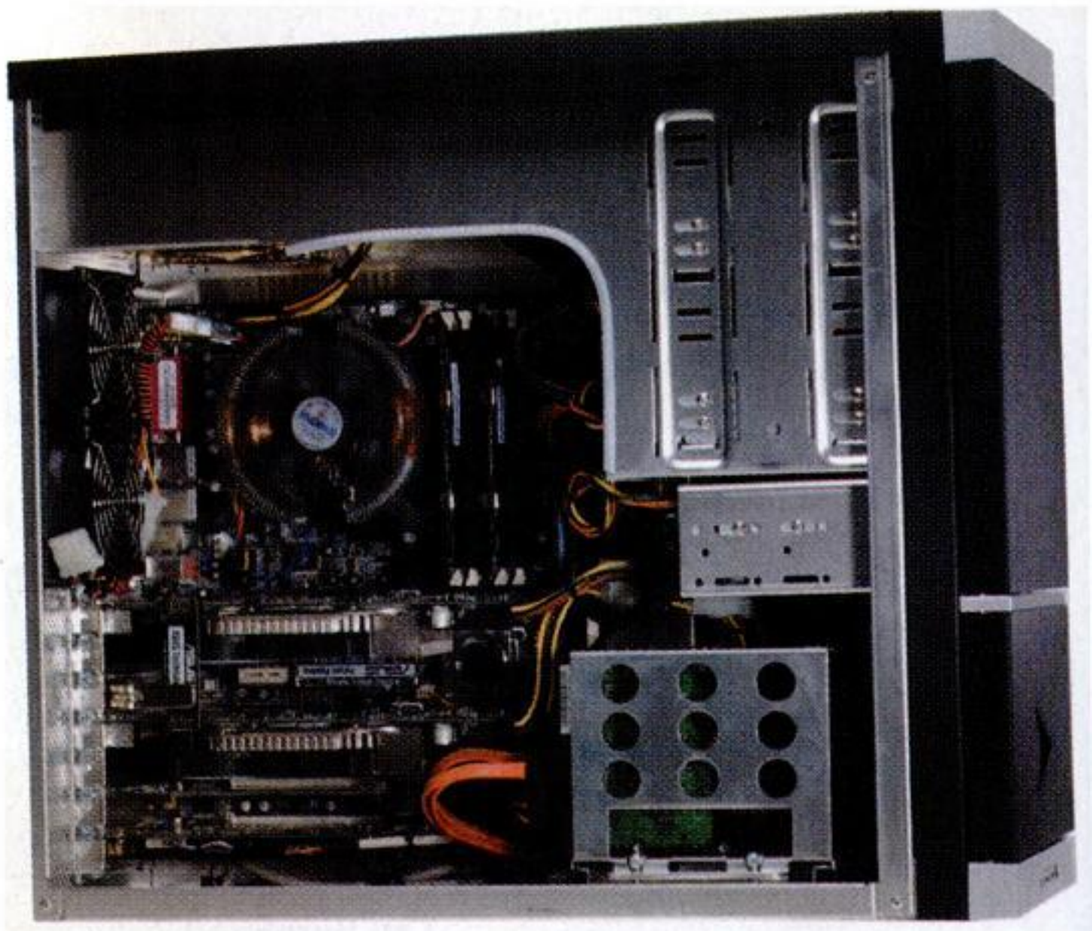
The final test of Will's resolve was also the most pungent. After being denied a request for tartar sauce, he clawed his way out of the suit to prove he was human, forgetting he had gone commando underneath. HR was notified immediately.

Intellectual material

Velocity Micro Raptor 64 Dual X

MAXIMUM PC KICK ASS PRODUCT

The wait for PCI Express is over for AMD fans



The SLI and Athlon 64 FX-55-powered Raptor 64 Dual X doesn't disappoint.

For months, Intel fans have been laughing at the AMD crowd over the lack of PCI Express on Athlon 64 FX mobos. Well, prepare to laugh back, AMDers, because you're now fully up to date.

The Velocity Micro Raptor 64 Dual X shows that waiting an extra six months has been worth it. In fact, the Dual X doesn't just boast PCI Express, it also features SLI, and a pair of wicked eVGA GeForce 6800 Ultra cards. The Raptor 64 Dual X isn't the first SLI system we've tested of course. Alienware sent us a water-cooled SLI rig last month Unfortunately, that rig was running a Xeon processor, not to mention DDR2-400 RAM—registered memory being a requirement of the Xeon pedigree.

Velocity Micro's Dual X is powered by AMD's jack rabbit–fast Athlon 64 FX-55 processor, while storage duties are handled by a pair of 10,000rpm Raptors drives, a 250GB Western Digital drive, and a pair of Lite-On burners (one of which is a double-layer DVD burner.) The entire package is wrapped in an aluminum case custom-made by Lian Li for Velocity Micro.

When it comes to 3D gaming, you'd expect two videocards to be faster than one—and they basically are, but not every test exposes the power of SLI. Take *Jedi Academy*. For us, this OpenGL gaming test has effectively become a CPU benchmark, especially at the 1280x1024 resolution we run for official scores. The Dual X kicked out 129fps in *Jedi Academy*, and while that's an outstanding frame rate, it's not a Lab record. The record goes to the Digital Storm Twister, which hit 133.8fps in December. The frame gap, though minor, is likely due to immature PCI Express drivers and the fact that SLI eats up a bit of rendering efficiency. Also keep in mind that *Jedi Academy* scores in the 130fps range are about 25 percent better than what we've seen Intel-based systems cough up. In *Halo*, even at a "low" 1280x1024 resolution, the Dual X set a new Lab record with a score of 114fps.

In general productivity apps, the Dual X rig hit a respectable 207 in *SYSmark2004* (the Lab record belongs to Falcon Northwest's 3.6GHz P4 Prescott-based FragBox II, which hit 214). In *MusicMatch* and *Premiere Pro*, the Dual X schooled all other Athlon-based machines, but didn't have the legs to defeat P4-based boxes. In fact, the record in *MusicMatch* actually belongs to a slightly overclocked P4EE-based Velocity Micro box we reviewed in June 2004.

The Dual X's final victory came in our *Photoshop* test. We've seen the *Photoshop* performance pendulum slowly swing from Intel to AMD in our processor showdowns, and this month's system testing confirms the power shift once and for all—the Dual X is now the fastest machine in our *Photoshop* action script. It not only clipped our own Dream Machine (based on a 4GHz Prescott P4), but also bumped the ZT Group's 3.46GHz P4 Extreme Edition rig from the winners circle.

Is there anything to bitch about? Well, while we love the case, the performance, and the looks, the system borders on loud. Of course, that's to be expected with this amount of hardware stuffed inside, and it's nothing that can't be fixed with a good set of surround-sound speakers and your favorite AC/DC album.

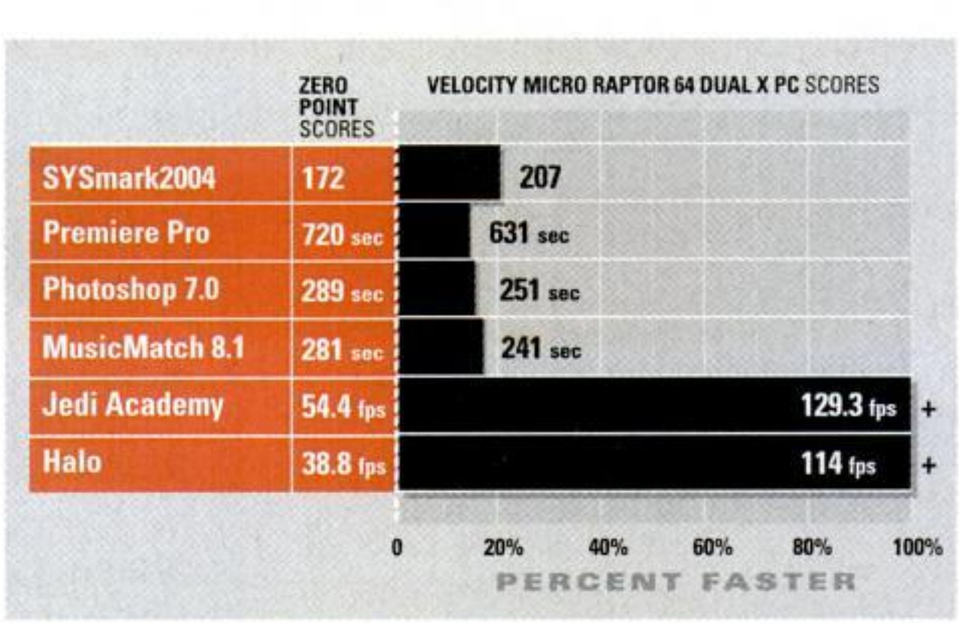
—GORDON MAH UNG

UNDER THE HOOD

THE BRAINS	
CPU	AMD Athlon 64 FX-55 (2.6GHz)
Mobo	Asus A8N-SLI Deluxe
RAM	1GB DDR400 Mushkin (two 512MB sticks)
I/O ports	Six High Speed USB 2.0, two FireWire A, PS/2 mouse and keyboard, parallel
LAN	nVidia Gigabit plus, 3Com Marvell 88E81001 Gigabit, ASUS 802.11B/G compliant Wi-Fi
DISPLAY	
Videocard	Two eVGA GeForce 6800 Ultra in SLI mode (425MHz core, 1100MHz DDR)
STORAGE	
Hard drives	Two 74GB Western Digital Raptor 10,000 RPM SATA running in RAID 0 using integrated nVidia RAID, 250GB WD2500JB Western Digital drive, media reader
Optical	16x Lite-On SOHW-1633S DVD burner, 48x Lite-On combo drive
AUDIO	
Soundcard	Sound Blaster Audigy 2 ZS
FINE DETAILS	
Case	Velocity Micro Signature Case
Fans/extras	Two 80mm rear, one 120mm front, Zalman CPU cooler, Antec 500 watt TruePower supply
Mouse	Microsoft USB Optical
Keyboard	Microsoft Multimedia keyboard
BUNDLE	

Windows XP, CyberLink PowerDVD, Ahead Nero, Corel WordPerfect bundle, Far Cry, UleadPhotoImpact, Video Studio, DVD MovieFactory, Burn.Now, ICopyDVDs2, Recovery Disc

BOOT: 40 sec. **DOWN: 17 sec.**



Our zero-point system includes: a 2.2GHz Athlon 64 FX-51, an Asus SK8N motherboard, 1GB of Corsair Registered TwinX DDR400 RAM, an ATI Radeon 9800 XT, a 250GB Western Digital WD2500JB hard drive, Plextor PX-708A DVD burner and a PC Power and Cooling TurboCool 510 Deluxe power supply.

MAXIMUM PC VERDICT 9

+ ARBY'S HORSEY SAUCE

PCI-E and dual GeForce 6800 Ultra cards can make a dead man smile.

– MCDONALD'S SPECIAL SAUCE

Just bordering on loud. Water cooling might be a good option.

$4,744, www.velocitymicro.com

Copyrighted material

Radeon X850 XT Platinum Edition

The fastest videocard we've ever tested—by a hair

We're starting to get tired of the old videocard leapfrog game, which goes something like this: The two major videocard manufacturers start with a major refresh of their product lines, releasing new GPU cores that demonstrate incredible performance advancements over the previous generation of chips. Then, for the next 18 months, each manufacturer trickles out minor GPU updates, squeezing just enough power from these updated designs to leapfrog over the competition's product in benchmarks, but not *so* much that users will be able to realize lifestyle-changing improvements in real-world games.

The videocards we reviewed six months ago—powered by the Radeon X800 and GeForce 6800 cores—fell in the "major refresh" category; each board was powered by a brand-new, "we went to town on this mother" GPU.

And then there's this month's ATI Radeon X850 XT Platinum Edition, which falls squarely in the minor upgrade category, and, in some respects, is more of a *downgrade* than an upgrade.

The biggest problem with the new board is its two-slot design. We've always held ATI's svelte single-slot cards in higher regard than nVidia's bulkier two-slot designs for obvious reasons. Those days are over, as the X850 XT Platinum Edition is ATI's first two-slot videocard. ATI's approach to two-slot cooling is different from others we've tested, in that the ATI cooler takes warm air from inside the case, blows it over the GPU heatsink, and then exhausts the air out the back of the case. Other cards simply recirculate the hot air inside the case. The ATI design should help circulate more air in the dead spot near your expansion cards, but we'd still rather have a single-slot card.

With any two-slot design, our first concern is noise. The X850 is extremely loud—think GeForce 5800 Ultra—when it first spins up. However, unlike the infamous 5800 Ultra board, we couldn't get the fan to run at high-speed after boot. Even under extended heavy loads, the card's fan ran at a slow enough speed to be practically inaudible.

ATI needed the beefier cooler in order to keep its GPU and GDDR3 memory chilly while running higher clock speeds than what is set for the X800 XT Platinum boards. The new Radeon's GPU clocks in at 608MHz (up from 520MHz), and the memory runs at 550MHz, up from—no, wait—down from 560MHz memory.

Down from? Did we say *down from*? Oh yes, indeedy!

ATI has realized the error it made when it set overly aggressive memory clocks for the X800 XT Platinum Edition boards. The company couldn't procure enough memory to meet consumer demand on the uber-high-end videocards, and thus left thousands of gamers who wanted to buy a $500 videocard out in the cold. We've been assured that the X850 XT Platinum will be available for everyone who wants to buy one. Period.

The X850 XT Platinum Edition is just marginally faster than the currently shipping X800 XT Platinum. We saw only small performance gains in most benchmarks, and none of the frame rate improvements warrant upgrading from the one-slot to the two-slot board. To us, a gain of less than 10 percent just isn't worth slot sacrifice. The X850 fared similarly when compared with GeForce 6800 Ultra boards. It showed negligible performance gains on all fronts, and we don't feel that sub-10 percent gains are worthy of your upgrad-ing dollar.

Holy Cow! It's a two-slot videocard from ATI. Too bad it's only an incremental upgrade and not much faster than last-gen boards.

Both the 6800 Ultra and the X800 XT Platinum Edition are in very short supply on retail shelves. Most of the high-end boards from ATI and nVidia go to large system vendors instead of retail outlets. So if you're still holding on to a last-gen NV30- or R300-powered board, you would be well-served by upgrading to this latest, greatest card—but only if you don't mind the dual-slot configuration.

—WILL SMITH

MAXIMUM PC VERDICT 8

+ MASSIVE UPGRADES

It's faster than anything else out there, if you want to be technical about it.

– INCREMENTAL UPGRADES

Two-slot cooling limits this board to full-size desktops. Forget about having the fastest video-card in your Shuttle.

$550, www.ati.com

TESTING PCI EXPRESS VIDEOCARDS

From this point on, we'll be testing PCI Express versions of videocards whenever possible. Our PCI Express test rig is an Athlon 64 FX-55 with 1GB of DDR SDRAM running on the nForce4-powered Asus A8N-SLI Deluxe. Aside from using a PCI Express capable system, our procedure for testing PCI-E cards is identical to our AGP videocard testing procedure. We use the same benchmarking suite for both types of cards.

BENCHMARKS	RADEON X850 XT PE
3DMark 2005 Default	6,259
3DMark 2003 Default	13,588
3DMark 2003 Game 2 – High Quality	58.7fps
3DMark 2003 Game 4 – High Quality	65.2fps
Halo 1.06	70.53fps
Doom 3 Demo001	39.7fps
Far Cry 1.1	81.1fps

All benchmarks were run on our PCI-E test system, featuring an AMD 64 FX-55 processor in an Asus A8N-SLI Deluxe motherboard with 1GB of DDR SD-RAM. Both 3DMark composite benchmarks are run at their default settings. All other tests are run at 1600x1200 with AA and anisotropic filtering disabled. Did you know that the eastern white-bearded wildebeest is commonly known as a gnu?

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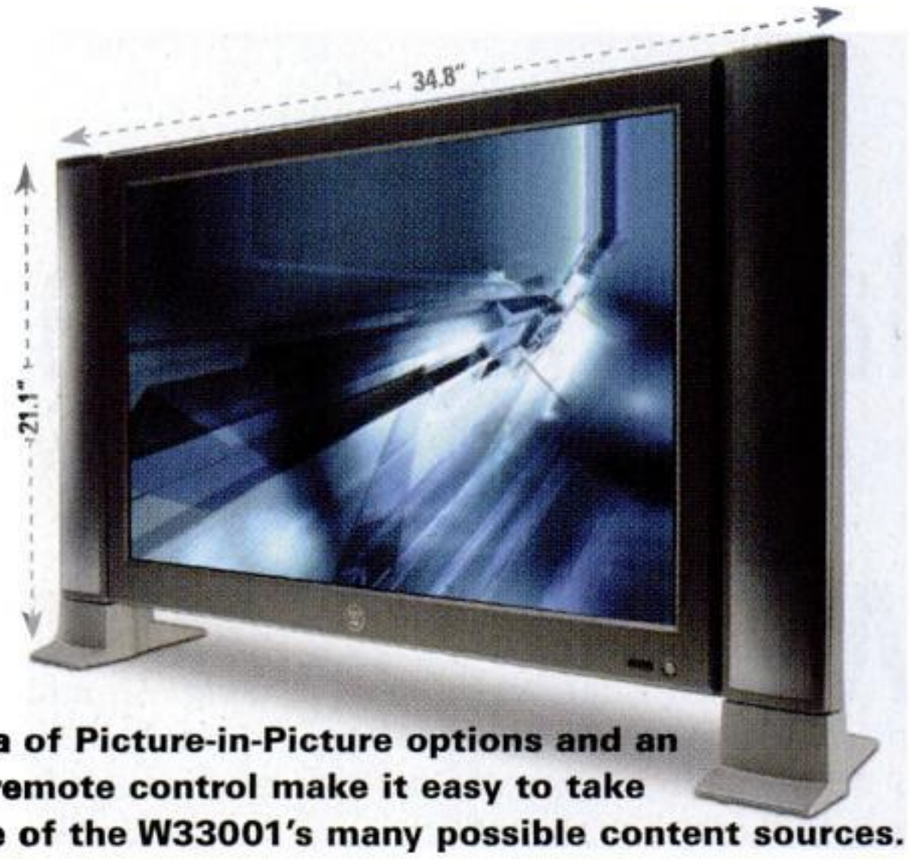
Westinghouse W33001 30-inch LCD

It's a good thing it's big, because it looks best from afar



A plethora of Picture-in-Picture options and an included remote control make it easy to take advantage of the W33001's many possible content sources.

Westinghouse probably isn't the first name that comes to mind when you think about computer LCDs, but the company is a big player—at least in terms of screen size. While most of Westy's offerings are LCD TVs, the largest panel in its lineup—just shy of 30-inches diagonal—offers DVI alongside all the other inputs you'd expect from a multimedia monitor, making our group of power users take notice.

As always, our first order of business was to introduce the monitor to our faithful friend *DisplayMate* (**www.displaymate.com**). Unfortunately, the relationship was not without conflict. Most notably, the display suffered color-tracking issues, evidenced by shifting hues among the various steps of *DisplayMate's* gray-scale ramps. In other words, there was a lack of balance between the red, green, and blue channels, causing tinges of these respective colors to surface at different gray-scale intensities. On a similar note, while the WW3301 did a fine job distinguishing between white and very light grays, the light grays were consistently pink in hue, despite the monitor being set at a "cold" color temperature. This should be a warning to anyone who's concerned with color accuracy.

Also of note is the display's 0.5mm pixel pitch—nearly twice as coarse a pitch as that of the 23-inch LCDs we reviewed in December. The pitch explains the visibility of the screen's pixel grid when viewing content up close. It also results in less-than-impressive text reproduction, with fonts of 10.5-point and smaller appearing blown-out. Legibility was compromised even further with serif fonts and reversed text (white type against a black background). Granted, with a display this large, you're likely to be at least three or four feet from the screen, in which case these matters are less critical.

SPECS	
Viewable area	29.5-inches diagonal
Native resolution	1280x768
Pixel pitch	0.5mm
Interface	DVI, VGA, 2 Component-in, Composite-in, S-video

In our *Need for Speed: Underground* gaming test, the W33001 performed adequately. Running with an interpolated resolution of 1024x768, we didn't notice any streaking, but we did see what looked like subtle texture-filtering issues in the foreground, which we haven't experienced before with the ATI 9600 graphics board we used to test the LCD.

In the end, the W33001 makes for a fine TV, a nifty game-console companion, a respectable display for DVD movies, but just a so-so display for PC games. It's also an impractical monitor for day-to-day desktop computing, to say nothing of digital image editing.

—KATHERINE STEVENSON

MAXIMUM PC VERDICT 7

+ SEVEN SEAS
Lots of connection options.

− SIX SIGMA
Color-tracking issues and a large pixel pitch.

$1,600 (street), www.westinghousedigital.com

GigaWorks ProGamer G500

Hard on your organs, but not on your wallet

A tethered remote control (not shown) is a cinch to use and includes an "upmix" button for playing stereo tracks in quasi-surround sound.

Creative Labs has downsized its 7.1 speaker system—the GigaWorks S750—to a more manageable 5.1 system "tuned for gaming." This revamp translates into one less driver in each of the satellites and a muscular subwoofer that's capable of turning your steak and tomatoes dinner into chili while still in your tummy. The satellites feel noticeably lighter, thanks to the absence of a dedicated tweeter. The four 36 watt sats sport a 3-inch midrange driver with a flared port to cover the lower midrange. During testing, the satellites' performance was damn good—they belted out crisp, piercing highs that never crackled or sounded muddy. Their output is a little on the bright side when the volume is cranked, but mids and highs sound delightful at reasonable listening levels.

The other half of the equation is the subwoofer, and this 8-inch front-firing unit does a fine job. When playing *Half-Life 2* with the G500 system, the Pulse Rifle's primary fire felt like someone was beating our chest with a set of massive drumsticks. Explosions shook the Lab walls and the satisfying "kaboom!" of the .357 Magnum felt and sounded like we were firing a real hand cannon. The subwoofer's only weakness is that it has trouble producing extremely deep bass tones, which cause it to fart and rattle a bit. The rattling never occurred during gaming, but rather only when playing audio test files around 50Hz or lower.

The G500 offers six-channel analog input, and includes an RCA stereo-to-mini-jack adapter for connecting a game console, though the rig unfortunately lacks a digital decoder and optical or coaxial jacks, which is what the Xbox uses for audio. A nice touch is that each satellite includes a removable stand, and Creative includes the necessary screws and brackets for wall-mounting the rear-channel speakers (Logitech could learn a lesson here). There's also an auxiliary jack for plugging in an MP3 player, but it's difficult to access because it's located on the rear of the subwoofer.

In the final tally, the G500 system scores major points for offering performance on par with systems costing almost twice as much. Despite a few small niggles, the G500 would make us think twice about shelling out $400 for a competing system from Logitech or Klipsch.

—JOSH NOREM

MAXIMUM PC VERDICT 9

+ CREATIVE LABS
Excellent gaming performance, great controls, and excessive power.

− CREATIVE FIBS
No digital decoder, Auxiliary jack is hard to access, and trouble with really deep bass.

$250, www.creative.com

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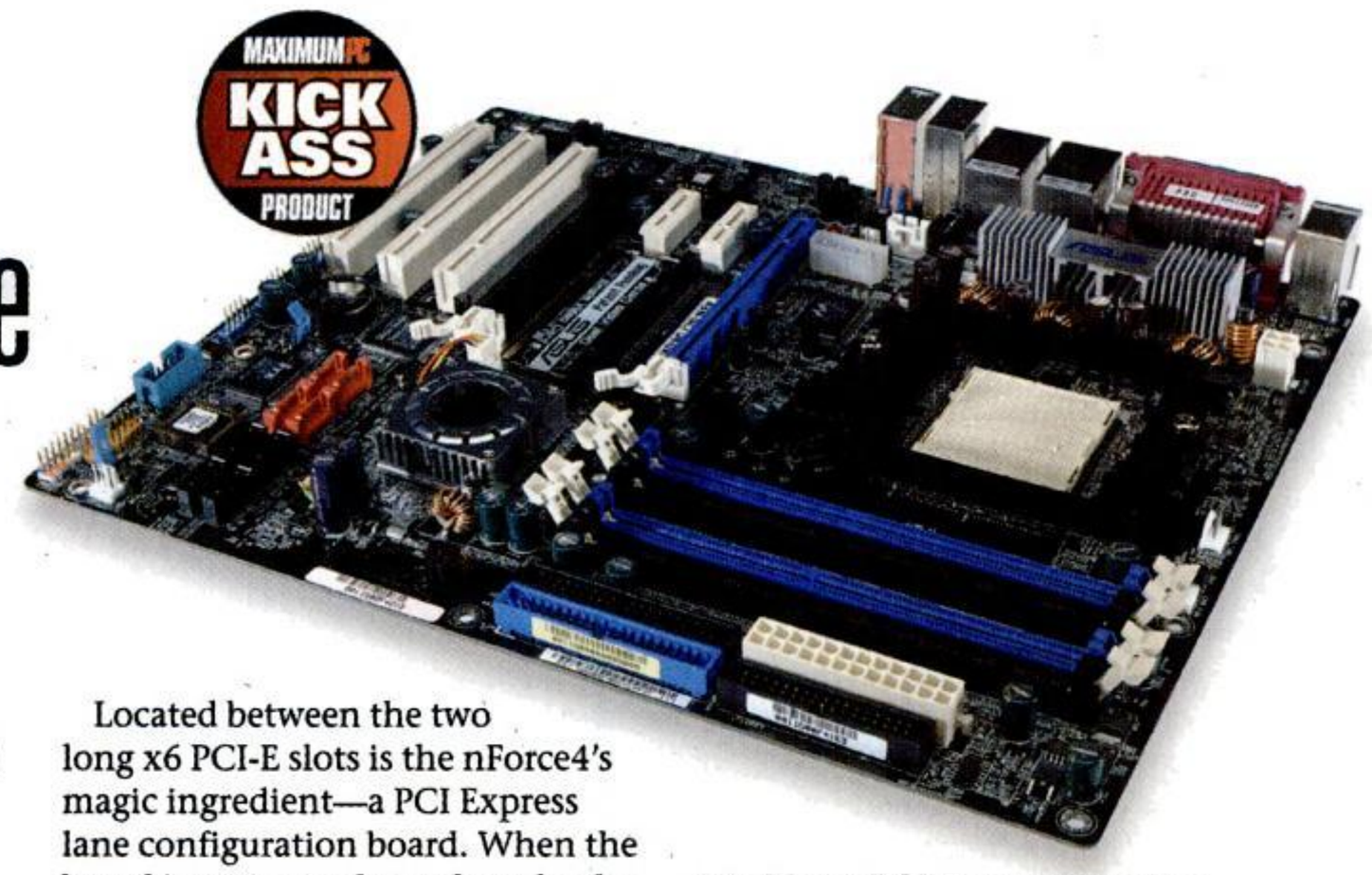
ASUS A8N-SLI Deluxe

SLI for the masses arrives (sorta)



It's like a PCI Express sundae with SLI on top.

If you've followed our coverage of nVidia's scalable link interface (SLI), you know we've been anxiously awaiting an SLI-capable mobo that doesn't require registered memory or an expensive workstation CPU. (SLI, of course, is nVidia's solution for running two PCI-E videocards in tandem for extra 3D rendering oomph.)

Well, our wait is over, because the nForce4 chipset in the Asus A8N-SLI Deluxe lets you run an Athlon 64 FX-55 CPU, regular DDR memory, and not one but two GeForce 6800 Ultra cards (as well as any other nVidia videocards that support SLI). Unlike some monstrous hardware kludge projects that yield very little performance for extra effort and money, the A8N-SLI/6800 Ultra combo delivers the goods—ultra-high-res gaming with AA turned on. You can, for example, comfortably play *Half Life 2* at 100fps with 4x AA and 8x anisotropic filtering at 1600x1200.

BENCHMARKS	
3DMark2001 Overall	25,937
3DMark2003 Overall	21,104
3DMark2003 CPU	1,134
3DMark2005 Overall	9,475
3DMark2005 CPU	5,098
SiSoft Sandra RAM Composite	6,000
Quake III 1.32 Four Normal	419
AquaMark	81,959
AquaMark GPU	12,729
AquaMark CPU	11,501

We tested with an Athlon 64 FX-55, 2GB of Corsair Micro DDR400, 300GB Maxtor DiamondMax 10 SATA drive, PC Power and Cooling 510 Deluxe Express, two GeForce 6800 Ultra cards, and a Sound Blaster Audigy 2 ZS.

The board features two x16 PCI Express physical slots, two x1 PCI-E slots, and three 32-bit PCI slots. Even with the board packed with two GeForce 6800 Ultra cards, you still have two slots free.

SPECS	
Chipset	nForce4 SLI
CPU support	Socket 939 AMD Athlon 64 and Athlon 64 FX CPUs
Expansion slots	Two x1 PCI-E, two x16 PCI-E (supports x8/x8 configuration or x16/x1), three 32-bit PCI
RAM	Four 184-pin DDR200-DDR400 in dual-channel mode. Max of 4GB
LAN	Dual Gigabit (one integrated into nForce4 SLI, one uses Marvell 88eE8001 chip)
Audio	RealTek ALC850 eight-channel audio
Storage	Two ATA133 PATA, eight SATA (four 3Gb/s)
I/O	Parallel, Serial, seven Hi-Speed USB 2.0 (four external, three headers), two FireWire A (one external, one header)

Located between the two long x6 PCI-E slots is the nForce4's magic ingredient—a PCI Express lane configuration board. When the board is set in single-card mode, the main PCI-E slot runs in x16 mode, while the second long PCI-E slot runs at x1. Reverse the board, and the two slots go into SLI mode, each running at x8. nVidia says it has found that the best performance comes from running both videocards balanced at x8.

The mobo is ATX 12V 2.0 compliant, which means it uses the new 24-pin power connector. To run the mobo off an older 20-pin power supply, Asus provides a feature called EZ-Plug, which lets you plug a standard four-pin peripheral power connector into the motherboard next to the PCI-E slots. Asus says this will let the board operate with older 20-pin PSUs when two videocards are installed. It sounds good on paper, but we found EZ-Plug to be a little unreliable with our test motherboard. For PSU duties, we used a PC Power and Cooling 510 Deluxe Express, and even with both videocards plugged directly into the power supply and the 24-pin connector in place, the BIOS prompted us to plug a power cable into the EZ-Plug.

The A8N-SLI gives you a bevy of storage options. Between onboard chipset support for four SATA 3Gb/s drives (which support a unique form of RAID that can combine PATA and SATA drives) and a separate Silicon Image 3114 controller with four SATA ports, there's no shortage of places to plug in drives. We also like the inclusion of two PATA ports, as a lot of newer PCI-E boards are cutting back to only one. There are simply too many legacy devices in use today for any mobo manufacturer to assume just one PATA port is enough.

Contrary to what we originally thought, the nForce4 chipset will *not* support Intel's HD Audio. For this reason, the Asus board taps a 16-bit RealTek part for sound chores. Of course, 99.99 percent of all geeks will ditch the integrated sound for higher-quality audio (we did all of our testing with an Audigy 2 ZS Gamer card).

In the benchmark hoedown, the A8N-SLI and its FX-55 lil' buddy busted a mighty respectable jig. To wit: We've seen a 3.6GHz Xeon system running SLI'd 6800 Ultras pull down *3DMark 2005* scores in the 7,300 range. We put the same two cards into the A8N-SLI and hit 9,475 without any serious tweaking. And some vendors have told us they've already cracked the 10,000 barrier with an identical rig.

We also saw excellent memory bandwidth numbers using *SiSoft Sandra:* The A8N-SLI was able to break 6,000MB/s. By comparison, a 3.46GHz P4EE system running DDR2 topped out at 5,780MB/s, while a VIA K8T800 Pro board running an Athlon FX-55 and regular DDR scored 5,770MB/s.

The A8N-SLI isn't a perfect motherboard. We're still a little bewildered by EZ-Plug, and the arms for the RAM modules are too close to the videocards for comfort. Still, we give Asus points for shipping the first PCI Express Athlon 64 FX mobo—and it supports SLI to boot!

—GORDON MAH UNG

MAXIMUM PC VERDICT 9

+ NFORCE

PCI Express and SLI arrive for the Athlon 64 FX!

– NFARCE

Close proximity of the RAM slots and videocard pose a risk to the latter.

$200 (street), www.asus.com

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Fisher FVD-C1 Pocket CameraCorder

We'd prefer a Fisher-Price Pixelvision to this high-priced Fisher

While it's one of the better hybrids we've tested, the CameraCorder still looks better than it performs.

Most gadgets that try to do two jobs with equal aplomb typically fail to deliver on either promise. Add to this pantheon of shame Fisher's FVD-C1, which tries its darndest to offer video and still-camera flexibility in an extremely portable package.

On the plus side, the Fischer is definitely the smallest, sleekest, hippest-looking hybrid we've tested, weighing in at a scant 5.4 ounces and enclosed in a smooth, clutter-free, shiny-silver shell. And it talks! A female voice steps you through the basic modes, which is pretty cool—albeit kind of freaky. But we like it (maybe because *we're* freaky.)

Designed to be used pistol-style, the C1 fits comfortably in one hand for the ultimate in point-and-shoot convenience. Unfortunately, its ultra-ergonomic design makes it difficult to hold steady for stills, and the top-mounted controls can be tough to use one-handed.

The 3.2 megapixel, 1/2.7-inch CCD is large for a camera this size. It allows you to shoot 640x480 video at 30fps in MPEG4 format (3MB/s compression), and still images at up to 2048x1536—not bad 'tall. At these resolutions, the included 512MB SD card can store nearly 500 pics and 20-plus minutes of video. (A variety of lower resolutions are also supported.) The 5.8X optical zoom is very nice, but very noisy as well; you will hear it operate on recorded videos.

Unfortunately, the video quality erred toward poor across all lighting situations. In moderate-to-low light, our video was extremely grainy, and in bright sunlight, overexposure was a significant issue, as was over-saturation with reds. Limited manual controls do not help right these wrongs. The C1 is capable of producing some nice stills (particularly in the macro range) if lighting conditions are ideal and if you can hold it steady. Still shots also suffer in low-light situations, however. The C1 doesn't have a traditional viewfinder, just a flip-out LCD display. We didn't find this to be an issue as the camera is designed to be used pistol-style, and the 1.5-inch LCD is bright and easy to view indoors and out.

The C1 represents the ultimate in portable convenience, and it can be a nice "extra" camera to own for situations when you just don't want anything bulkier, and require both video and still performance. With a thorough understanding of its limitations, it can perform serviceably. But when it comes to preserving memories, we need better than that. We look forward to seeing what the second generation from Fisher brings.

—STEVE KLETT

MAXIMUM PC VERDICT 6

+ HYBRID VIGOR

Small, easy to use and set up. Nice macro and stills.

– KISSIN' COUSINS

Video quality is poor to average at best across all lighting conditions. Over-saturated reds.

$800, www.fisherav.com

Antec Phantom 350

New PSU eliminates the *fan*tom menace

The Phantom's 350W output is a fair trade-off for its near-silent operation.

These days, the loudest component in any system is probably the power supply fan. Today's high-performance rigs demand greater amounts of power, which means higher-wattage PSUs, which means *hotter-running* PSUs, which means a greater need for PSU cooling, which means that the sound coming from your computer is not the din of an arctic whiteout. It's just the sound of a regular-old PSU fan doing its job.

Antec's new Phantom 350 PSU puts the kibosh on excessive noise by being only moderately powerful and entirely silent. Gone is a fan of any sort. Goodbye. Finito. In lieu of a dedicated blower, Antec has engineered the actual *body* of the Phantom 350 into one giant aluminum heatsink that wicks away heat from the power supply's innards.

Flip on the power switch, and the only noise you'll hear is an almost imperceptible hum. The supply itself is ATX 12V 2.0 compliant, and thus comes with the full complement of power connectors: a 24-pin main connector (along with a converter for 20-pin motherboards), a six-prong plug for PCI Express videocards, two SATA connectors, two floppy connectors, and seven four-pin peripheral connectors.

We were afraid to run the load test we used in last month's PSU roundup because the Phantom is rated for just 350 watts, but we did run the same sag test. The Phantom, like most PSUs, gave up the ghost at 60 volts. That's not too horrible, as only the best units will yield reliable power at that level.

The U.S. version of the Phantom doesn't include support for power-factor correction, though the European version does (likely because of European regulations). Power supplies with PFC support put less stress on the wiring of a building or electrical grid. While good for your utility company and your home's wiring (you can have more machines on a given circuit if they're running PFC), this technology also chews up some efficiency. Without PFC, the Phantom is spec'd at a stupendous 86 percent power efficiency, whereas most PSUs feature 70 percent efficiency under heavy loads. This means the Phantom should consume less electricity than its PFC counterparts.

The real issue with the Phantom is its 350W power output, which we feel is below the minimum requirement for Dream Machine-level, loaded-to-the-brim computers. That said, for special applications, the Phantom is an amazingly efficient—and quiet—PSU.

—GORDON MAH UNG

MAXIMUM PC VERDICT 8

+ EAR PLUGS

Quiet. Damned quiet.

– ULCERS

Only 350W. Cables should be fully braided.

$200, www.antec.com

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Power to create your digital home.

The Intel® Pentium® 4 Processor with HT Technology and the ZT PRO X6000 Series systems give you more power to create the digital home.
Edit your digital photos while checking a news video. Browse the Web while distributing music to the stereo with your digital media adapter.

intel inside HT pentium® 4

Complete PC | Email & Web Browsing | CD, MP3 Radio Playing & Recording | TV, DVD Watching & Recording | Image Watching & Processing | Powerful Gaming

ZT GROUP recommends Microsoft® Windows® XP Media Center Edition 2005 for home computing and entertainment.

Super Quiet — The chassis fits nicely into your living room cabinet replacing your CD player , DVD player and radio tuner.

★★★★★

" It's flat and sleek, designed to slide into a home Entertainment cabinet and replace a DVD player, CD player and stereo tuner, It can be operated from the couch with a remote-control, allowing full access to a library of music, movies, home video and other digital entertainment ". (LA Times 10/5/04)

★★★★★

Something that works the most buzz surrounded the PC home entertainment centers: streamlined systems from ZT Group that integrate TV, movies, music, slide shows and Web surfing
(USA Today 11/22/2004 edition)
http://www.usatoday.com/tech/products/2004-11-21-bonus-pcs_x.htm

ZT PRO Media Center PC X6581

Intel® Pentium® 4 Processor 530 with HT Technology (3 GHz, 1MB L2 Cache, 800MHz)
Microsoft® Windows® XP Media Center Edition 2005
Dual TV Tuner & Remote Control
Intel® D915P Mainboard
1GB PC3200 Dual Channel DDR400
200GB SATA/150 Hard Drive
128MB ATI RADEON™ X300 SE w/TV-Out & DVI "PCI EXPRESS"
DVD/CD±RW Dual Density Drive
8 in 1 Media Reader
Intel® High-Def 7.1Audio
Full 7.1 RCA Analog Outputs, Digital Output (SP-DIF & Coax)
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3 Firewire 1394 & 4 USB 2.0 connectivity
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Quality Assured • 24x7 • Lifetime Tech Support
*** Price subject to change without notice**

ZT GROUP

Purchaser is responsible for all freight costs on all return of returns of merchandise. Full credit will not be given for incomplete or damage returns. Absolutely no refunds for merchandise returned after 30 days. All prices and configurations are subject to change without notice and obligation. Opened software is non-refundable. All return have to be accompanied with an RMA number and must be in re-sellable condition including all original packaging. System's picture may include some equipment and/or accessories, which are not standard features. Not responsible for errors in typography and/or photography. All rights reserved. All brands and product names, trademarks or registered trademarks are property of their respective companies. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

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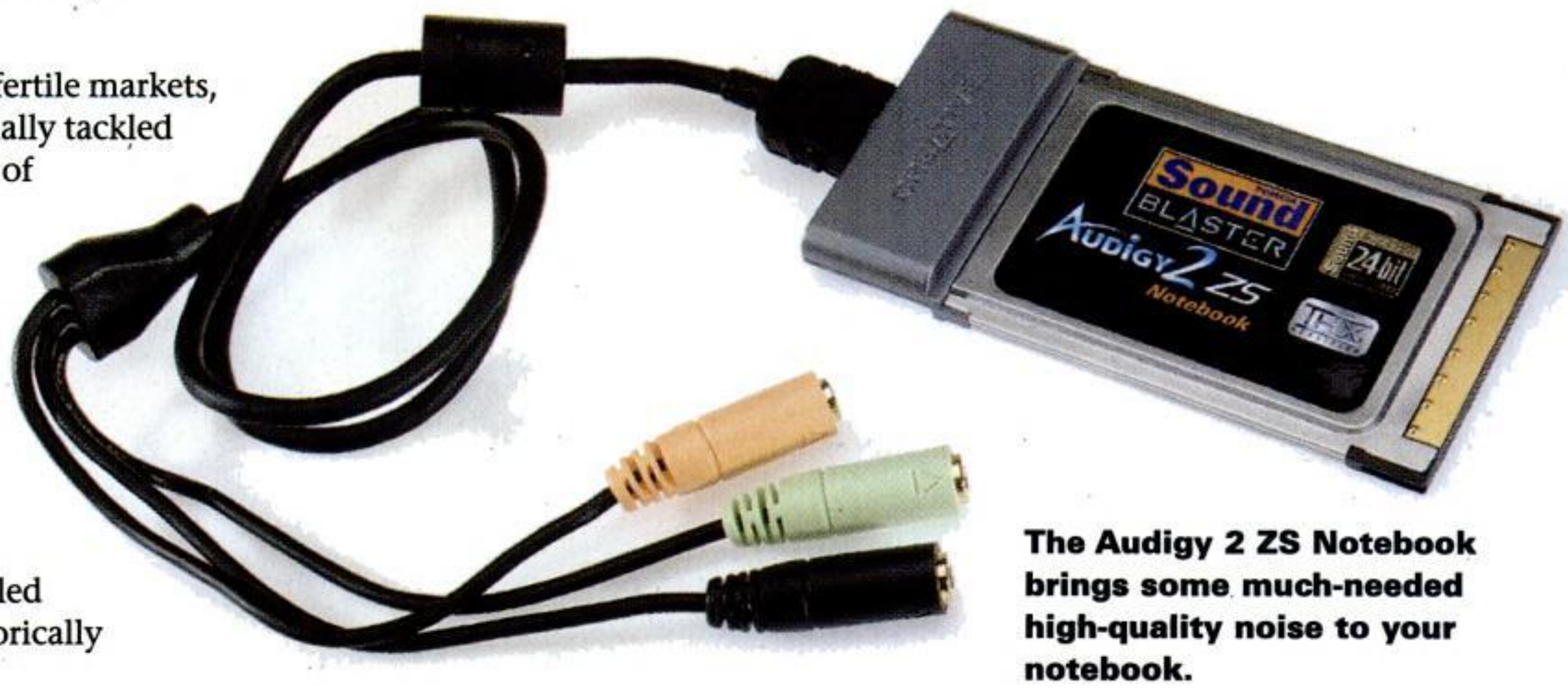
Sound Blaster Audigy 2 ZS Notebook

Good audio on a notebook. No, really!

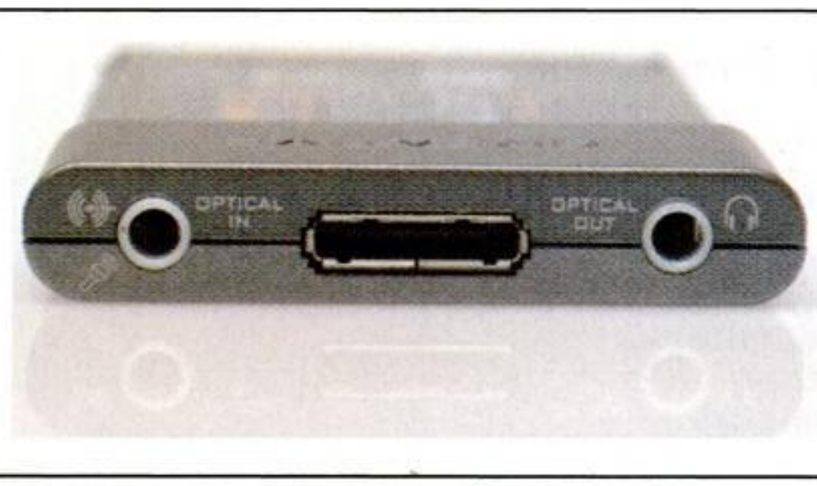


The Audigy 2 ZS Notebook brings some much-needed high-quality noise to your notebook.

In its search for fertile markets, Creative has finally tackled the last bastion of piss-pour audio: notebooks. Creative's new Audigy 2 ZS Notebook soundcard offers notebook users a solution to the low-quality, buzz- and static-filled audio they've historically been subjected to.

The Audigy 2 ZS Notebook is pretty much what it sounds like: an Audigy 2 ZS miniaturized into a CardBus-enabled PC Card. And while it doesn't exactly match the features of its desktop soundcard sibling, this external soundcard comes pretty close. The main difference is that the signal-to-noise ratio for the notebook version drops from 108dB to 104dB. It also lacks MIDI support and RCA SPDIF support.

You do, however, get all flavors of EAX—including the computationally heavy EAX 4 and true hardware acceleration of DirectSound3D. The card features two mini-jacks, one for headheadphones/2.1 speakers and the other for mic/line-in. Both pull double duty as optical SPDIF I/O ports, but optical functionality is automatically disabled if you're playing DRM-protected content.



These two mini-jack ports serve double-duty. You can plug your headphones and mic into them, or you can use them as optical ports.

To get full 4.1, 5.1, and/or 7.1 support, you have to use a small dongle cable with a tri-mini-jack connector. Typically, PC Card dongles turn us off, but instead of cheaping out and forcing you to unplug and carry the dongle with you (and risk losing it), the Audigy 2 ZS Notebook allows you to simply unhook the dongle from the card and leave it home when you travel, using the onboard mini-jack instead.

Of course, the card will let you record in 24-bit, and it supports 24-bit/192kHz playback in stereo mode and 24-bit/96kHz playback in multichannel mode. Additionally, the Audigy 2 ZS Notebook lets you play protected-content DVD Audio discs.

Most importantly, the Audigy 2 ZS Notebook excels in the one area where notebooks typically falter: audio fidelity. To test the Audigy 2 ZS Notebook card, we installed it on a notebook with a RealTek ALC202 AC97 CODEC rated for 90dB and listened to high sample-rate sources. While the output from the ALC202 actually sounded pretty good for a notebook, it couldn't compare with the Audigy 2 ZS Notebook, which offered so much more presence and resolution that it was easy for our ears to tell the two apart.

It's important to note that this soundcard won't improve the audio quality of your notebook speakers, which are usually hard-wired to an onboard soundcard. The Audigy 2 ZS Notebook is limited to headphone or external speaker use, which is just as well—you would be unable to hear the differences between your notebook's onboard 16-bit audio and Creative's 24-bit enhancement using speakers that are the size of a quarter.

We were concerned about the Audigy 2 ZS Notebook's power consumption, so we threw our notebook on a watt meter to see if power consumption increased when using it. With the card installed and the DSP for EAX effects enabled, we saw a negligible increase in power consumption but probably not enough to make a noticeable impact on battery life.

This soundcard falls into a strange category. For people who only use their onboard speakers for DVD and music playback, the Audigy 2 ZS Notebook makes no sense at all. But for gamers who want to add multichannel audio to a notebook, headphone users, and anyone who is disappointed in the recording capabilities of their laptop's onboard audio, the Audigy 2 ZS Notebook is a clear winner.

—GORDON MAH UNG

SPECS

Card type	Type II CardBus
SNR	104dB
I/O ports	Headphone/speaker-out, line-in/mic-in, SPDIF input and output, three analog out

MAXIMUM PC VERDICT 9

+ GEORGE COSTANZA

High-fidelity audio in a notebook.

– GEORGE MICHAEL

Why not 108dB? Should include a real carrying case, not Saran wrap.

$130, www.soundblaster.com

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MGE Quantum

One of the coolest cases we've ever tested—literally

The nifty-looking front-panel LCD lets you monitor and control the speed of up to seven case fans individually. Too bad the display is illegible from an angle.

The Quantum is a serious enclosure that is both quite large and jam-packed with features. This full-size ATX case is made entirely of steel, so you probably won't be toting it around to LAN parties. The upside of its heavy metal construction is sturdiness.

The front bezel is a two-piece design. The outer door contains a system-monitoring LCD display, and when opened reveals four 5.25-inch bays, two 3.5-inch bays, and the power switch. A second door swings open for easy drive installation. With both doors closed, the bezel can be locked shut to prevent unauthorized access, which is a great security feature.

With a twiddle of two thumbscrews, both of the ventilated side doors pop off to reveal an extremely spacious interior. Drive installation is mostly tool-less, with snap-on rails used for both optical and magnetic drives. Two 3.25-inch bays in the standard location require screws. Below these bays is another side-facing bay that holds all the plastic rails in little trays. If you remove the trays, the space can accommodate an additional three 3.25-inch drives, although there are only enough extra hard drive rails included for two drives (oddly, rails for up to six optical drives are included). PCI slots use a tool-less locking mechanism that holds cards very securely.

Cooling is not a problem, as the Quantum includes a total of five fans. There are three 80mm fans—one down in front, one on top, one near the CPU—and two 92mm units mounted on a swing-out door that covers the entire left-side of the interior. All fans plug into to a convenient seven-fan connector mounted inside the case, so there's even room for two additional fans—not that you'd ever need them.

Now for the bad news: The case comes with no documentation. Furthermore, there is no "support" for the Quantum case on the company's web site, and calls to the support center were not returned. Who needs support for a case? You will. The front LCD panel lets you tweak numerous settings as well as control fan speeds, but without instructions, you'll have a hard time figuring out how to implement these features.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ BLACK STEEL
Obscene cooling, locking panels, tool-less.

– BLUE STEEL
Largely useless front panel, no tech support.

$160, www.xgbox.com

Enermax CS-10182

A case for geeks with a sense of aesthetics

If ornate designs and garishly colored LEDs aren't your cup of tea, the CS-10182 could be the case for you.

Over the last few years, computer stores have been invaded by legions of factory-modded cases featuring preinstalled windows, wild paint jobs, and neon LEDs. To some PC users, the trend is a blessing; others see it as a plague. If you fall into the latter category, consider the Enermax CS-10182, a sturdy full-size tower that caters to power users without compromising on aesthetics.

Available in green, yellow, silver, and black, the CS-10182 looks elegant and offers space aplenty for all your components. This roomy case fits two external 3.5-inch drives, four optical drives, and six hard drives. According to Enermax, it even accommodates Extended-ATX motherboards. Optical drives and hard drives are kept snugly in place with screw-less rails that make drive-swapping a snap, and extra rails can be conveniently stored in an unused drive bay. As for all your external peripherals, you'll find two USB ports, one FireWire port, and headphone and microphone jacks on the top of the case.

Of course, a system packed with high-end hardware must have cooling prowess to match, which the CS-10182 delivers in spades. Ventilation holes pepper the front, side, and top of the enclosure, and mounts are provided for up to seven 80mm fans (two are included with the case). A swing-out panel on the inside of the CS-10182 allows cooling fans to be aimed directly at the CPU and videocard, and Enermax was thoughtful enough to include washable filters for the air intakes.

Now for the gripes. The motherboard tray is nonremovable, and the tool-free expansion-card locking system isn't strong enough to hold even medium-size cards in place. Fortunately, you can use screws as an alternative.

The door guarding the external drive bays opens just 90 degrees, so it's difficult to access your drives if you keep your computer on your right side. And the hinges supporting the entire front panel (which swings open for easy service) feel flimsy and fragile—on our test unit, they broke off during shipping and had to be replaced.

Nitpicks aside, the Enermax CS-10182 is a well-crafted enclosure with tasteful stylings. It falls short of a Kick Ass award, but even so, it's worthy of serious consideration.

—OMEED CHANDRA

MAXIMUM PC VERDICT 9

+ WINONA RYDER
Sturdy frame; plenty of space and cooling for all your components; stylish.

– WINNING THE RYDER CUP
Flimsy front-panel hinges; nonremovable mobo tray; ineffectual expansion-card locking system.

$75 (without power supply), www.enermax.com.tw

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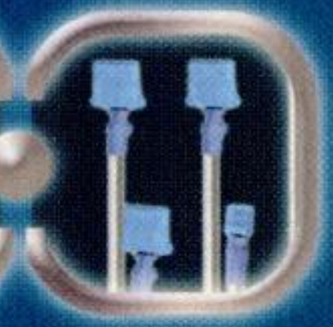

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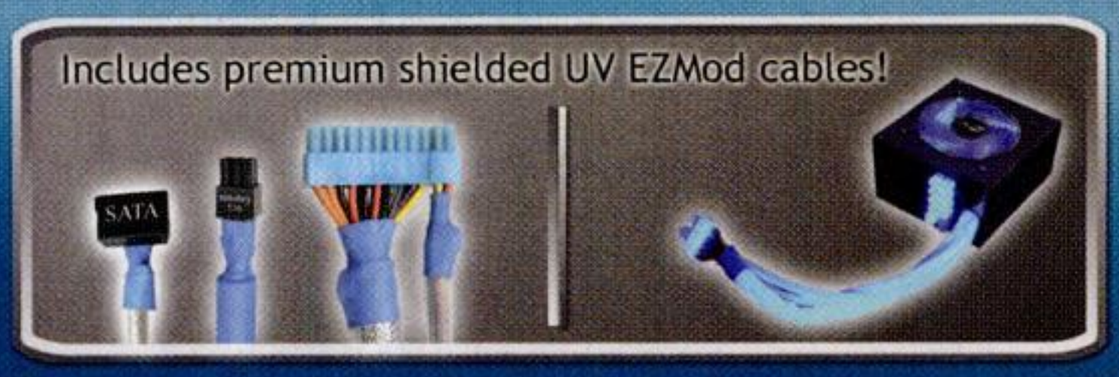

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Digital Audio Imbroglio

Or: How small can these damn things get?

Although the manufacturers of MP3 players seem resigned to interfaces that are inferior to the iPod's standard, they're dropping prices, shrinking sizes, and packing in more features than we even knew existed. As the MP3 players keep tumbling out of the hopper, it's our duty to don the headphones and report on the progress.

—LOGAN DECKER

Although just 2-inches long and less than an ounce in weight, the MPIO FL300 manages to pack in more chocolaty goodness than most larger MP3 players.

256MB MPIO FL300

Like the psychotically belligerent short guy you knew in high school, the MPIO FL300 seems determined to prove that its size is no reflection of its abilities. It's not only the smallest MP3 player we've ever tested, but, to our amazement, also one of the most insanely feature-packed, monster-garaged MP3 players in history. Don't let the dainty size fool you—this baby plays MP3 and WMA files loud as hell, and we're impressed that a bauble of these proportions can eke out more than 9.5 hours of battery life per charge.

Loading the player couldn't be easier, as the FL300 shows up as a removable drive in Windows Explorer (as do all the players in this roundup). But while most players will simply dump all the tracks into a single directory, the FL300 can retain folder structures, so you can quickly navigate to the album of a particular artist, or create a playlist by dragging tracks into a folder and then dragging that folder onto the player through Explorer. Why don't all flash- and hard drive-based players work this way?

Extras range from the practical (custom EQ settings, voice recording through a built-in mic, and audio scanning so you can hear a track as you fast-forward through it) to the ridiculous (like a digital alarm clock that can wake you up with your own MP3s—if you happen to sleep with your earbuds in). The FL300 is so small you can wear it around your neck, stuff it in a pocket, or tuck it behind your ear, but its size will be an annoyance to big oafs with huge paws. And the transfer rate is atrocious, slower than most USB 1.1 players. But the FL300 is still a surprisingly badass player, packed with goodies for nimble-fingered folk.

MPIO FL300

MAXIMUM PC VERDICT 8

BUNS

Big sound and an orgy of features.

PUNS

Slow transfer rate, and may be too small for some.

$130, www.buympio.com

Five gigabytes never looked, or sounded, so bad.

5GB Rave-MP ARC5.0

The ARC5.0 is not an MP3 player you'd wear with pride. The silver plastic looks tacky. It's molded in a shape that recalls Kenny from South Park. The rubber USB port cover won't stay put and flaps around as if it were desperate for attention. Despite all this, it was still incumbent on us to test how it sounds. The news is not so good. It doesn't get very loud, which might be a safety feature, but more likely is just a way of disguising the terrible bass response that distorts even mild thumps 'n bumps.

There's a smattering of attractive features, including an FM tuner and FM recording, and the battery lasted more than 11 hours, which isn't disgraceful. But we can only endorse the ARC5.0 insofar that it's better than not having any MP3 player at all. Especially considering that for the same price you can buy the Rio Carbon—the player that kicked the iPod Mini's shiny butt.

Rave-MP ARC5.0

MAXIMUM PC VERDICT 3

WHOLE GRAIN

It does, in fact, play MP3s.

MIGRAINE

Generally unpleasant and inferior.

$250, www.rave-mp.com

256MB WeWa Zealot WMP-4000+

Austere design and great sound come together in the Zealot. And if it's stolen, the thief will never be able to figure out how to use it.

After the Stanchion, the Zealot is the second in a series of MP3 players from WeWa that appear to have gotten their names from words pulled out of the dictionary at random. But we're more than willing to accept the company's strange practices—its hardware developers do know how to make a damn good-sounding player. The volume is downright intimidating, and sounds slightly less trebly and more mellow than the MPIO FL300. Sound quality is right up there with the iPod Mini, although we can't say the same of the interface.

In fact, the Zealot is sort of the anti-iPod in that respect. Although it allows you to use folders as playlists (like the FL300), you'd never guess that you access the folders by holding down the leftmost button for a few seconds, and if you can figure out how to make a voice recording without consulting the manual, we'll throw you a fish. That's too bad, because the scary interface discourages use of interesting features like the adjustable-speed fast-forward.

If you've got the patience for the interface, you'll dig the wonderful sound of the Zealot. But please don't turn to WeWa for advice when naming your kids.

WeWa Zealot WMP-4000+

MAXIMUM PC VERDICT 7

SALARY

Fantastic sound!

MALADY

Awful interface!

$160, www.cirago.com

As always, all players were tested with Shure's E3c headphones ($180, www.shure.com; treat yourself!)

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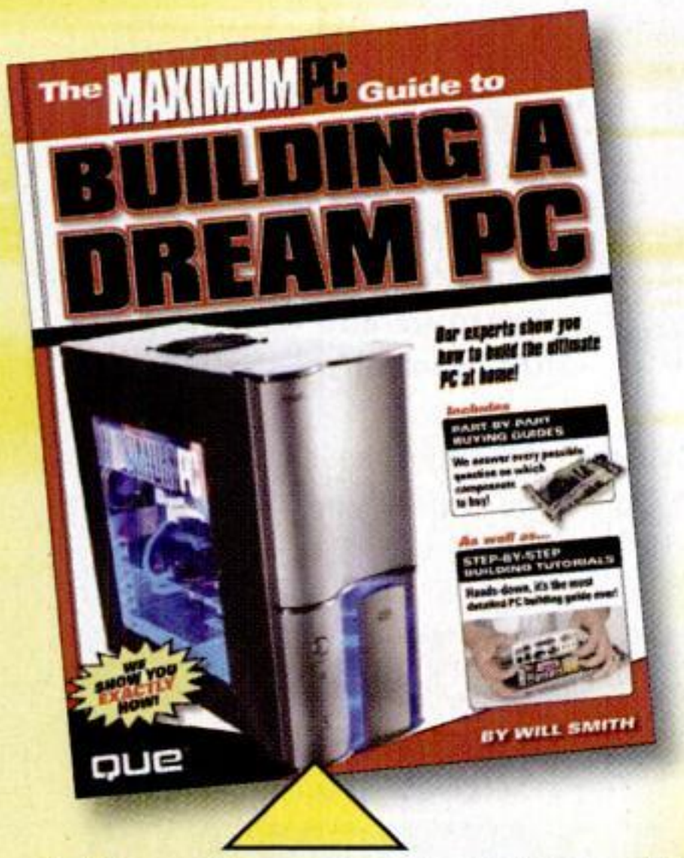
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BY WILL SMITH
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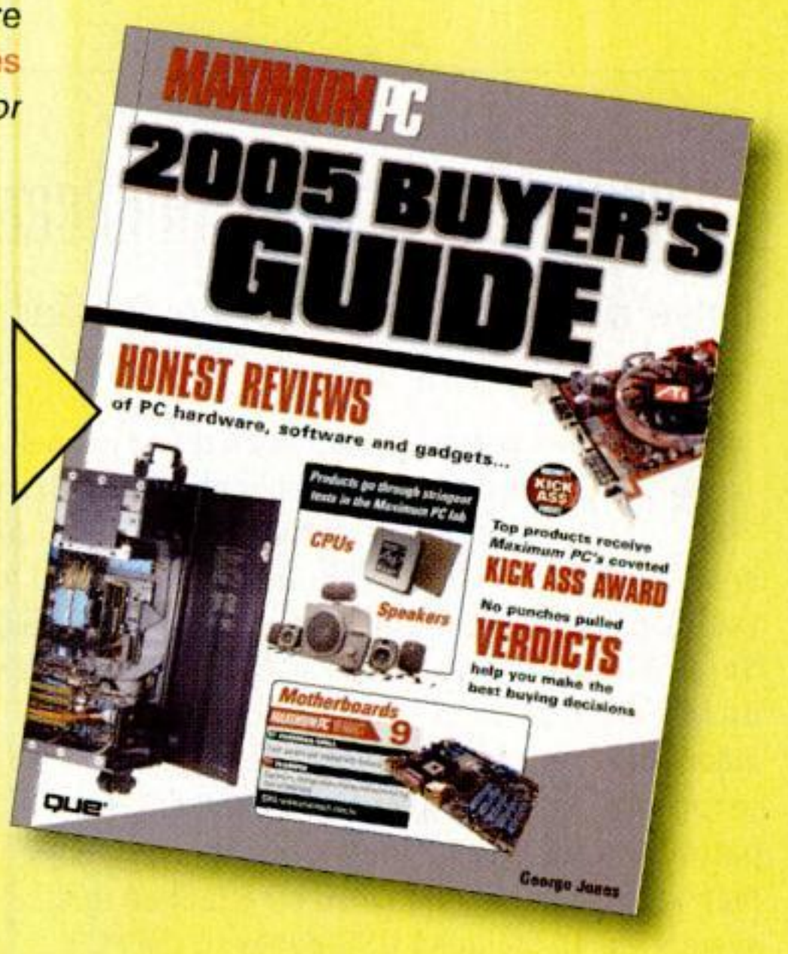

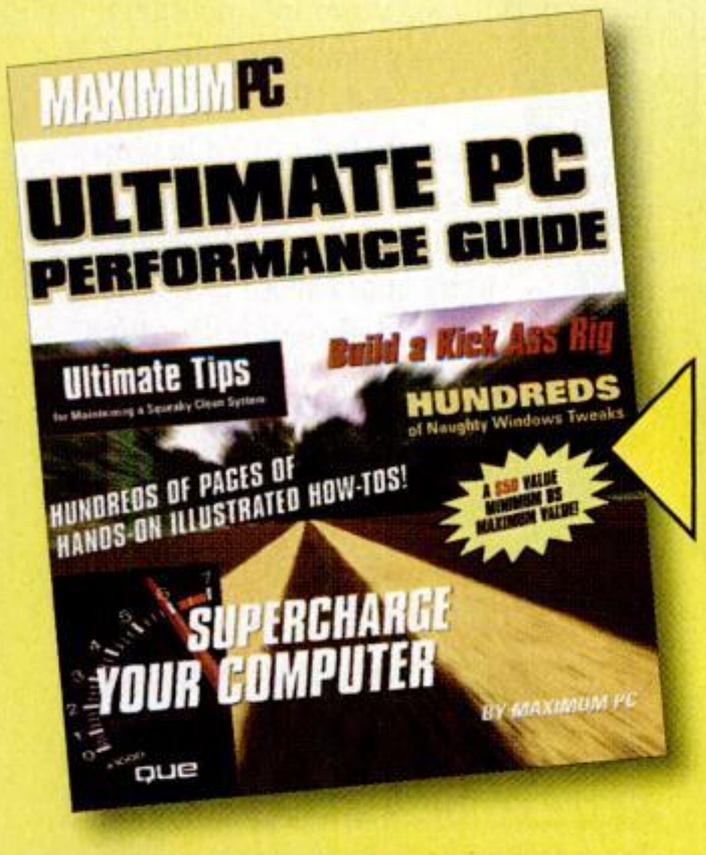

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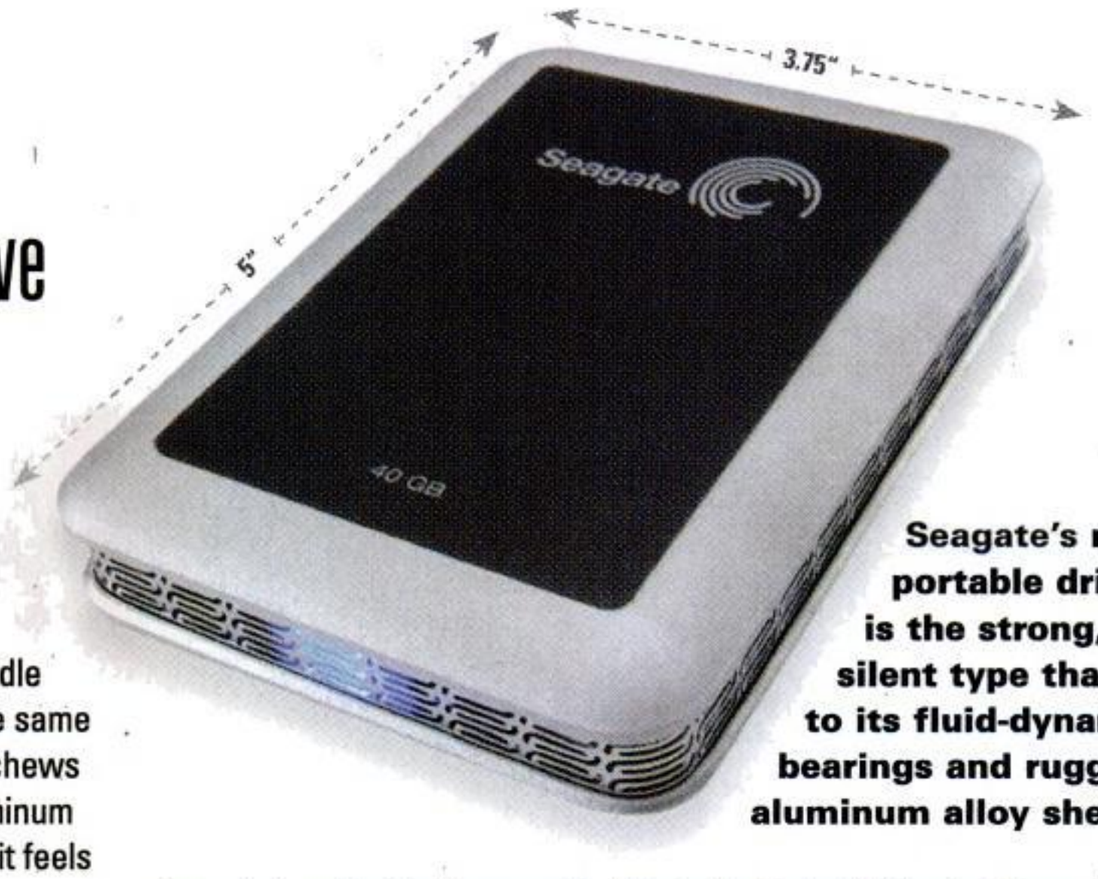

Seagate's new portable drive is the strong, silent type thanks to its fluid-dynamic bearings and rugged aluminum alloy shell.

Now that Seagate is manufacturing 2.5-inch notebook drives, it makes perfect sense the company would enter the booming portable storage market by slipping one of its new wee drives into a rugged shell and slapping a USB 2.0 bridge on it. The drive we tested this month features a 40GB Seagate Momentus drive with a spindle speed of 5,400rpm, though Seagate also offers a 100GB version with the same spindle speed. The most notable characteristic of the drive is that it eschews a slim, sexy profile in favor of a slightly larger footprint and rugged aluminum alloy shell. It's definitely larger than other USB drives we've tested, but it feels like it's by far the most durable.

This USB 2.0/1.1 drive is solely bus powered. Unlike other USB drives we've tested, Seagate's drive connects to the PC with a dual-head USB cable. One cable is marked data/power, and the other is for additional power when needed. About 50 percent of the time we needed to plug in both USB connectors to get enough power to the drive, but an equal number of times only the data/power cable was needed, even on front-mounted USB ports.

In Lab tests, the drive performed quite well in terms of throughput, averaging around 16MB/s write speeds, with read speeds hovering in the 20MB/s zone, which is excellent. It's also worth mentioning that the drive uses fluid bearings, making it extremely quiet during file transfers.

There is a software bundle, but it includes a few largely useless utilities (diagnostic, LBA addressing, etc.) that are available for download on Seagate's web site. Then again, this is the kind of drive that doesn't need a software bundle because it doesn't require you to install any drivers. Still, it would have been nice to have a copy of the high-quality "toolkit" software Seagate includes with its 5GB Pocket drive, which allows you to create hidden partitions on a drive in case you loan it out and want to keep secret your Divx rip of *Bad Boys 2* (or some other embarrassing file).

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ LEDS

Very rugged, decent capacity, no drivers required.

– IEDS

Larger-than-average formfactor, software bundle is largely useless, small capacity.

$160, www.seagate.com

Logicube Sonix Drive Duplicator

Drive copying doesn't get any easier than this

It's expensive, but the Sonix includes all necessary cables, backup software, a CF card, and this badass carrying case.

Operation is simple. Pop open the clamshell case and attach the drive you want to duplicate. The Sonix includes connections for both parallel ATA and Serial ATA drives, and an optional connector for 2.5-inch drives is also available. Next, you plug in the target drive, which can also be parallel ATA or Serial ATA. Finally, you depress the start button twice and the drive cloning process begins. Though Logicube states the Sonix is capable of speeds up to 3.3GB per minute, in Lab testing, we cloned a 3.16GB partition in roughly 4 minutes, so your speeds may vary. The Sonix can also be attached to a system via an included USB cable so the PC's drive can be cloned without ever popping off the side door, which is really cool.

Other features of the Sonix Drive Duplicator include a built-in Compact Flash reader and a 64MB card that can be used to transfer new software and firmware updates to the device. It can also be used as a standard media reader.

While the cost concerned us, we were pleased to discover that more advanced diagnostic and drive-wiping utilities can be "unlocked" by entering a code you receive from Logicube into the device. Unfortunately, the code costs $200, and whenever we called the sales or tech support line to get the code, we were told no one was available to take our call. We left messages, but our calls were never returned. We ultimately contacted a company spokesman and finally received our code. Our take is that for $2K the diagnostics should be included, and easier to access.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ DRIVE COPYING

Fast copying, easy to use, thorough manual, tons of cool extras.

– EXAM COPYING

Pricey, and you have to jump through hoops to get extra features.

$1,895, www.logicube.com

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Ama Technologies DVX-POD

Portable video player gives a nod to the iPod

With its sleek white styling and luxurious screen, the DVX-POD portable video player is one luscious slab of hardware porn. But you'll receive scant help from the bundled software when you attempt to put video content onto its 20GB hard drive, which makes portable DVD players of similar size more practical and of better value.

At 7.5-inches wide and more than an inch thick, the DVX-POD isn't the kind of gadget that breezily vanishes into a pocket, but the payoff is a 6.5-inch diagonal screen that supports full DVD resolution. That's impressive, and the picture looked every bit as good as we expected it to. The DVX-POD dished out deep and gooey-rich color in our high-bitrate test videos, and the low-temperature polysilicon display technology—which integrates LCD electronics on the display itself, rather than on the periphery of the screen—makes the most of screen real estate. The DVX-POD also supports more formats than any other portable video player we've tested. Divx, Xvid, Windows Media Video, and even Quicktime—they're all copasetic.

Even so, only one of our randomly downloaded test videos played correctly on the DVX-POD. All of the video content we ripped and encoded ourselves from DVDs played fine, but we had to use our *own* software and know-how to get things working, as none is provided with the DVX-POD. The device will record from your DVD or VHS player, but even at the highest quality setting the results looked blocky. And unlike Archos' AV400, the DVX-POD doesn't have any scheduling facility for recording from TV.

Is it the smallest big-screen portable video player, or the biggest small-screen portable video player?

The big screen is mighty nice, but we would have traded some of the more quotidian features—such as photo and MP3 playback and a voice recorder—in favor of the more advanced video playback capabilities that would have honored such a handsomely equipped second-gen portable vid player.

There's no support for direct playing of VOB files. Battery life remains under four hours. The 20GB drive is measly compared with those found in portable audio players. And we're extremely disappointed that the DVX-POD isn't the first portable player to support AC3 audio playback. That's too many complaints for an expensive video player that doesn't offer consumers more convenience than a portable DVD player that can read burned DVDs.

—LOGAN DECKER

MAXIMUM PC VERDICT 6

+ PULSARS

Tasty large screen provides an alternative to portable video "peepshows."

– ULCERS

No ripping/encoding software provided; fewer features than other players.

$600, www.amatechnologies.com

Razer Diamondback

It's ultra-sensitive—for your pleasure

We're not going to waste time writing about Razer's miss-and-miss history with high-precision gaming mice. We're just going to say that the new Diamondback is the smoothest, most accurate-feeling mouse we've ever tested.

The two main buttons are slightly larger than we'd prefer, but their chubbiness is acceptable. And unlike earlier Razer mice, you can actually put pressure on the Diamondback's buttons without accidentally clicking and shooting your buddy in the head, which is definitely nice. We're not as enthusiastic about the side buttons. There are four poorly positioned side-mounted buttons on the ambidextrous Diamondback, two on each side. It's easy to hit them accidentally, and it's practically impossible to hit the correct side button on the first attempt during a heated deathmatch. (Solution? Just don't map the side buttons to important keys!)

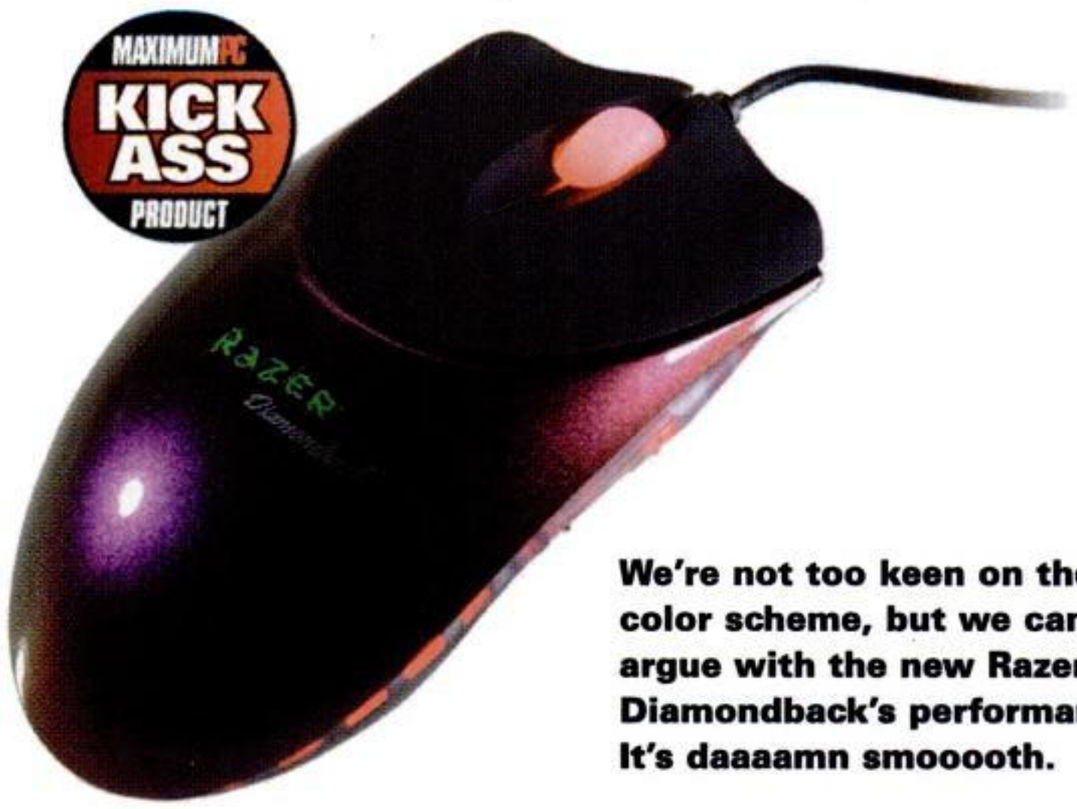
The Diamondback's optical sensor is the real star of this one-mouse show. The 1600dpi sensor boasts a higher refresh rate than that of other optical mice, and its ultra-high performance shines through when you play games that demand superhuman reflexes, such as *Counter-Strike*. In a nutshell, the mouse is pixel-accurate, providing smoother movement than we've ever experienced before from *any* mouse—optical, mechanical, even mice of the laser persuasion.

Once you configure the bundled software, pressing the mouse's number four button will toggles through sensitivity settings. This is great when it comes time to use a sniper rifle, as the mouse's extra-sensitive default setting can quickly be toggled to something less sensitive so you can dial in on a target half a mile away.

It's also worth mentioning that the Diamondback's sensor is actually in the proper place—under your knuckles, not under your palm. You don't have to move your entire arm to get good mouse movement; a flick of the wrist will suffice.

The awkward side-mounted buttons are a drag, but the incredible precision and smooth movement of the mouse more than make up for these relatively superficial flaws.

—WILL SMITH



We're not too keen on the color scheme, but we can't argue with the new Razer Diamondback's performance. It's daaaamn smooooth.

MAXIMUM PC VERDICT 9

+ FIELD MICE

If its high-resolution sensor and pixel-perfect accuracy aren't enough, it also comes with its own carrying case.

– LAB RATS

The side buttons are so difficult to use we unbound them permanently.

$60, www.razerzone.com

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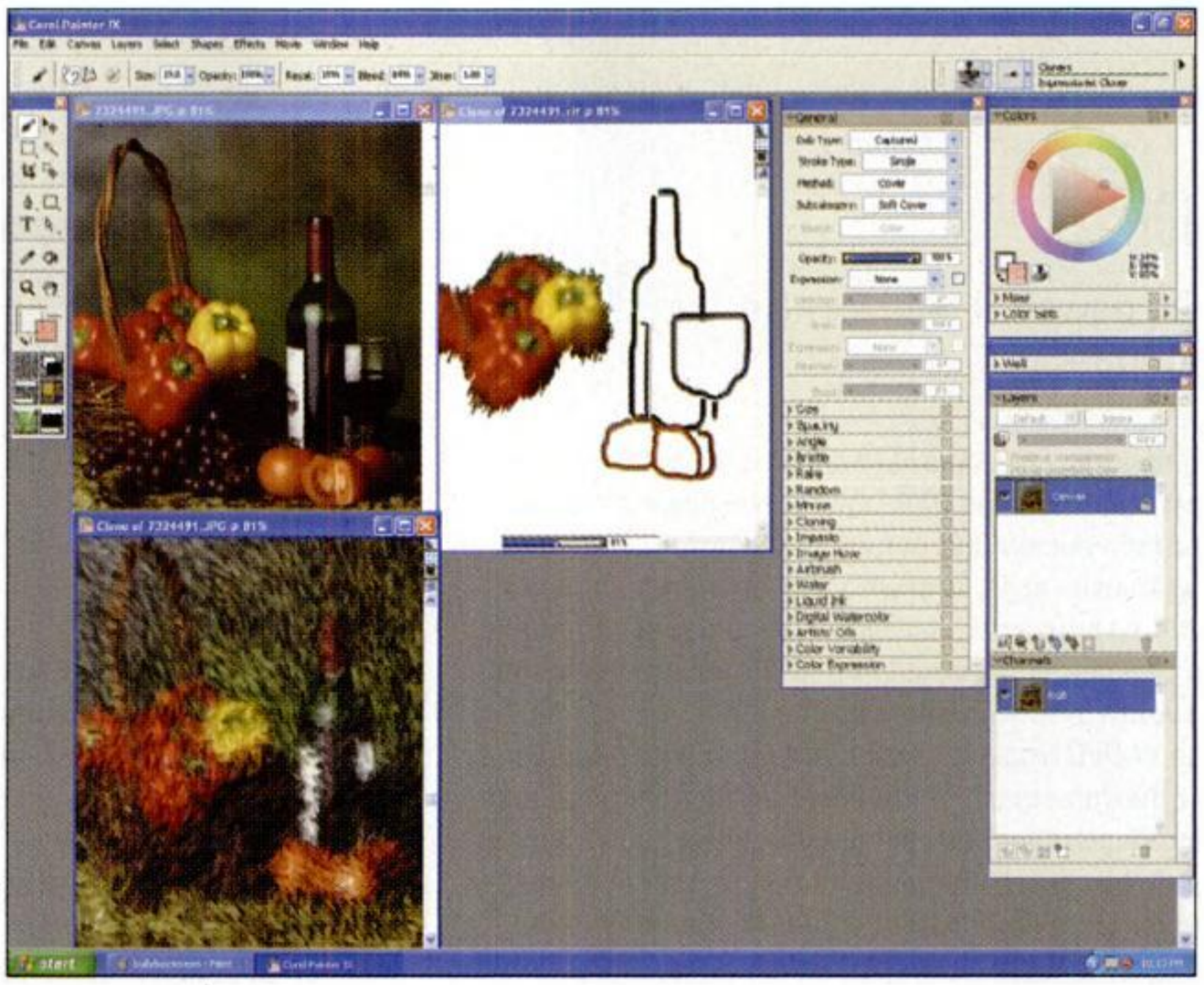
Corel Painter IX

Doodlers and dabblers need not apply



You can turn a photograph into something arty by cloning it into a new window with the paints and brushes, or by letting the Auto Clone tool (here using the Impressionist Cloner brush) do the job for you.

Opening *Painter IX* is like walking into the best-stocked artist's studio you've ever seen. Whether that makes you feel like a kid in a candy store or a bull in a china shop depends a lot on how much artistic ability—and patience—you bring to the program.

This isn't a drawing app for dashing off a holiday card. This is serious, capable art-creation software, as powerful and complex as *Photoshop* in its own way. It's also so difficult to master, it carries the potential for frustration and disappointment.

To start with, you can choose from among 30 surfaces to work on, ranging from French watercolor paper to worn pavement—and if that's not enough, you can make your own. You have nearly as many brushes to work with, from charcoal to chalk, each with a couple dozen variations—and if that's not enough, you can make your own. You can pick colors on a color wheel or from predefined sets—and (all together now) if that's not enough, you can make your own with the innovative Color Mixer, which lets you smear different paints together on a virtual palette until you get something you like.

The result is a program that lets digital artists create pretty much anything traditional artists can create. Every ink, crayon, or chalk brush you might choose can behave with real-world accuracy. For example, if you paint with watercolors on a highly textured canvas, the surface grain will remain visible. Use a goopy oil paint on that same canvas, and the grain will be obscured. Even better, *Painter* lets you *defy* real-world media constraints. For example, you couldn't combine oil paints on gessoed canvas with colored pencils on heavy paper in the same piece (absent some collage work, anyway). In *Painter*, you can.

Learning how to make the program do what you want is the challenge. Not that Corel hasn't tried to help: The package comes with a booklet featuring tutorials by well-known digital artists; a 417-page PDF User's Guide; access to online tutorials; and a Help file. But while these materials tell you what everything is, they can't really tell you what everything does. The combinations of brushes and surfaces are practically limitless, so there's no way to adequately explain them all. Sticking to combinations that have real-world analogs—like watercolor paint on watercolor paper—will flatten the learning curve. Otherwise, be prepared to experiment, and experiment, and experiment. Also be prepared for palette- and menu-option overload, because there's no way a program this powerful can get away with a simple, intuitive interface.

One approach that makes experimentation easy and fun is the Clone capability. It's similar to *Photoshop's* Clone Stamp tool, in that it copies from a source into a target image. The twist in *Painter*, however, is that cloning can also apply tool settings to the target as you go. For example, you can paint a copy of a photograph into a new document with pastels or markers—it's like applying *Photoshop's* Artistic filters, but with a lot more options and control.

Corel says *Painter IX* is dramatically faster than previous versions. We weren't able to do a head-to-head comparison, but we can say that on the Dell Inspiron XPS we used for testing the software, there was almost no lag or jerkiness in using any of the brushes. Other new features include the aforementioned Color Mixer palette, and watercolors that now stay wet from one painting session to the next.

If you're an artist or artistic wannabe, there's no other software that does what *Painter* does. Do yourself a favor, though, and get a drawing tablet to go with it. Trying to paint with a mouse adds a degree of difficulty that no one need suffer. (Corel offers *Painter*-Wacom tablet bundles, some of which come at a reduced price.)

—JAKE WIDMAN

We sketched this mean guy with a felt-tip marker, added detail to the shoe with a black pencil, and then started to paint his shirt red before we grabbed this screenshot. (All props to *Learn to Draw Cartoons* for actual artistic instruction.)

MAXIMUM PC VERDICT 8

+ PABLO PICASSO

More painting tools than you'll know what to do with.

– THOMAS KINKADE

More painting tools than you'll know what to do with. Interface defies elegance and simplicity.

$430 ($400 download), www.corel.com

Copyrighted material

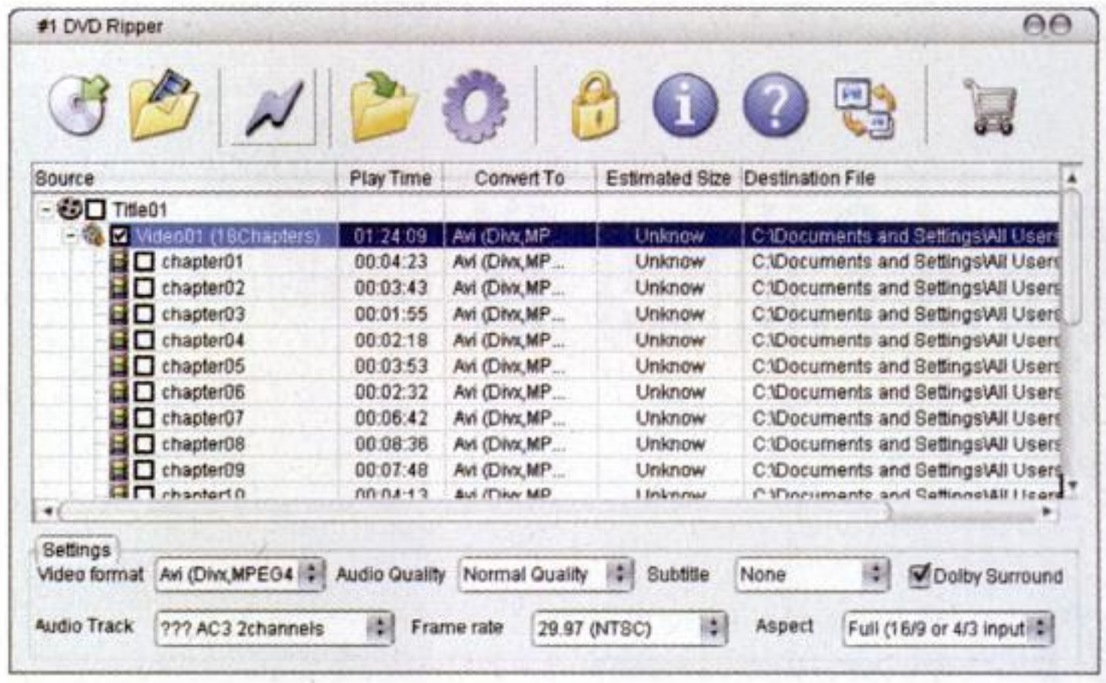
#1 DVD Ripper

Finally, a reliable, powerful, easy-to-use DVD-to-MPEG4 ripper

For the last year, *Maximum PC* editors have scoured the net, searching for a program that seamlessly rips DVD movies and converts them to an MPEG4 based format—namely Divx or Xvid. We've tested literally dozens of freeware and shareware apps, all of which suffered from fatal flaws: ridiculously complex set-up processes, constant crashes, and some just plain haven't worked. Then came the aptly-named *#1 DVD Ripper*. It's easy to use, rock-solid stable, and works beautifully every time.

Ripping a DVD with *#1 DVD Ripper* is simple. First, the software scans your DVD for video content, then breaks out all the videos on the disc by title and chapter. You select the chapters you want to rip, select either a multi-pass or single-pass encode, and then define the audio and subtitle tracks you want to use. Once that's done, you click Rip, and let *#1 DVD Ripper* work it's mojo.

The ripper doesn't actually ship with any MPEG4 encoders, so you'll need to download and configure either Xvid or Divx yourself. For best results with either codec, we recommend you go with a two-pass encode, at the very least. On the first pass of a two-pass encode, the encoder first scans the entire video file to suss out a strategy. In fact, on the first pass, no video is actually written to disk! On the second pass (which is usually called the Nth pass in the encoder control panels), the encoder uses the information gathered during the first pass to allocate more bandwidth to difficult-to-encode high-motion scenes. Encoding times are more dependent on the codec you use than the DVD ripping software itself, but you can expect a two-hour DVD to rip and encode each pass in about an hour and forty-five minutes on a 3GHz P4.



Want to know what kicks ass? Backing up DVD movies to a media server, so they can be streamed to any PC in the house. *That's* what kicks ass.

In its current version, *#1 DVD Ripper* requires the user to manually change codec settings between the first and second passes when encoding multi-pass MPEG4 files. We'd really like to see this become automated in order to make one-click DVD rips possible. But even without one-click ripping and encoding, *#1 DVD Ripper* is undeniably the best DVD archiving program we've tested.

—WILL SMITH

MAXIMUM PC VERDICT 9

+ FAIR USE

It's easy. It works. We love it!

– PIRACY

Shouldn't every thing be automated these days?

$35, www.dvdtox.com

Strata 3D CX

3D imaging program trades high-end tools for ease of use

Strata 3D **is a 3D design and illustration package that's been popular with Mac addicts for awhile. Now that a PC version is available, we figured we'd see what all the fuss is about. With a layout and functionality that mimics an Adobe design suite, designers will find the application easy to jump into. However, while the interface is inviting, the program falls short by catering too much to newbies at the expense of more advanced features.**

Objects in *Strata 3D* start out as Bezier curves (these curves act a lot like NURBS, or non-uniform rational B-splines—a mathematical representation for smooth curves and surfaces). Once you have a basic shape built, it's easy to edit individual curves and use shape deformers, but more advanced editing is difficult for several reasons: First, the app doesn't allow patch modeling, which is essential for character sculpting. Second, in order to make precise changes to a model, you have to convert the object to polygons. No biggie, right? Well, one of the drawbacks to using polygons in *Strata 3D* is the lack of virtual handles needed to move points, edges, and faces in the X, Y, or Z direction. Instead, you are forced to select and move the point, edge, or face in one step. If you accidentally select the wrong point edge or face, you'll have to undo your action and try again, which is frustrating to say the least.

Once you've created your object and want to render it, matters improve dramatically. *Strata 3D* offers a potent rendering package, with options that include Radiosity for soft shadows, and High Dynamic Range Images for realistic lighting and reflections. The process is simplified a great deal by a set of presets for basic rendering needs, including "good," "better," and "best" settings for raytracing, toon shading, and Radiosity. Advanced options, on the other hand, include windows full of lengthy listings with little to no explanation as to what the options do.

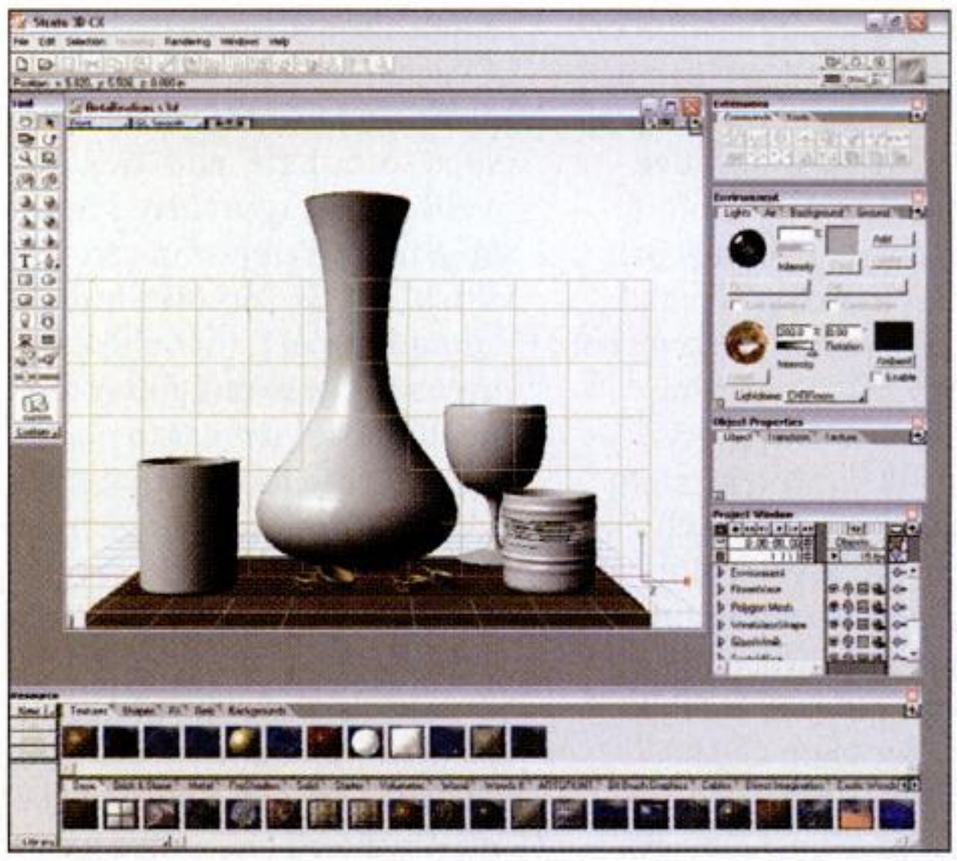


Image courtesy of Howard Prince.

***Strata 3D* has plenty of objects to play with, but this doesn't make up for its plastic-looking renders.**

While *Strata 3D* may have everything necessary for a Macintosh 3D artist, we can't recommend it when far more complete and flexible packages are available to a 3D enthusiast using a PC.

—MICHAEL COLEMAN

MAXIMUM PC VERDICT 6

+ PIXAR

Adobe-style user-friendly interface, Radiosity and HDRI support.

– DISNEY

Interface isn't consistent, advanced options are confusing, and there's no orthographic view!

$700, www.strata.com

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Sid Meier's Pirates!

Was it worth waiting 17 years for?

A strange gestalt is at work in Sid Meier's *Pirates!* Considered individually, its many elements seem an odd lot, embracing strategy, naval combat, trading, light role-playing, rhythm matching, simple arcade fighting, and exploration. None of these is handled in any great depth, and the initial experience (at least for those unfamiliar with the 1987 original) might be one of mild disappointment. After all, ship combat comes down to a one-on-one game of maneuvering no matter how large a fleet you've assembled, the sword-play seems lifted from a lesser console game, and what's with the dancing, anyway?

MAXIMUM PC KICK ASS PRODUCT

Those impressions pass out of mind unnoticed under the sheer cumulative joy of the entire experience. This is not some unholy union of *Age of Sail*, *Sea Dogs*, and *Dance Dance Revolution*. It's something else. "Live the Life" the game urges as it opens, and that's what it offers: the life of a pirate presented as a single tapestry woven from disparate pieces. That life begins in violence, as your character is orphaned and ultimately takes to sea with a letter of marque to find fame, power, wealth, and clues to the fate of his family.

The core of the game is a sun-drenched map of the Caribbean, complete with islands, ports, towns, hazards, storms, treasure, and plenty of ships going about their business. (The English, Spanish, French, and Dutch are all competing for the region, and you can choose to play as any of them, each offering different pros and cons. Strangely, you can work for *every* nation, becoming a captain for the British or a Major for the Spanish.)

Pirates! rapidly settles into a groove and becomes almost impossible to stop playing. You make calls at foreign ports, refit and repair your ship, take to sea for battles, sell cargo, take on jobs, talk to the governor, visit the tavern to buy or cajole information or objects—including maps, clues about your family, and skill-enhancing items—hire on new crew, and repeat until your men become so pissed off (and they will) that you have to sell everything and start again.

In the process, you age, rise in stature and rank, try to win the hand of the governor's daughter, and find out the fate of your family. Despite (or perhaps because of) these patterns, *Pirates!* is never less than completely addictive. Even the slightly silly dancing and fencing sequences are entertaining because they add another aspect to the adventures of a lifetime. Taken together, it all forms something far greater than the sum of its parts.

—THOMAS L. MCDONALD

The optional dance sequences use an innocuous and simple matching game, but it's worth taking a couple of minutes to do them because the rewards are often worthwhile items.

MAXIMUM PC VERDICT 9

+ DREAD PIRATE ROBERTS

Many different styles of gameplay are shaped into a light, fun, and addictive adventure.

– LONG JOHN SILVER

A few minor details, such as being unable to hotkey from the trade menu to the map or name save games.

$50, www.atari.com

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The Lord of the Rings: The Battle for Middle-Earth

Fight for good or evil in the most exciting battles from the movies

Creating a real-time strategy game based on three of the most popular films in recent memory—which in turn were based on the three most popular fantasy novels ever written—is a formidable challenge. After the paragon of mediocrity that was *Command & Conquer: Generals*, we had serious doubts that EA was up to the task. Thankfully, after spending countless hours immersed in *The Battle for Middle-Earth*, we're happy to report that our fears were unfounded. The latest *Lord of the Rings* game isn't perfect, but it is decidedly well-crafted and an absolute blast to play.

The Battle for Middle-Earth features three modes of gameplay: campaign, skirmish, and multiplayer. The latter two are worthwhile, but the real star of the show is the single-player campaign, where you choose between good and evil, then fight through the entire *Lord of the Rings* storyline. The game's script stays mostly true to the films, though there are occasional deviations.

The single-player campaign is long and satisfying, with dozens of missions for each side. Some of the missions are optional, but it's worthwhile to complete them for the additional rewards you receive, especially because the units you train and the powers you obtain carry over from mission to mission. Regrettably, the vast majority of the missions are simplistic search-and-destroy affairs. While that type of mission is fun, we would have liked to see some more creativity on the part of the developers.

The Battle for Middle-Earth emphasizes fast-paced action at the expense of resource gathering and base building. The game employs a single generic resource that can be obtained in various ways, such as building farms or plundering enemy bases. Meanwhile, buildings can only be constructed at specific locations where a foundation exists. This limits a player's freedom, but it also discourages defensive playing and eliminates some of the annoying tactics that plague other RTSes, like tower rushing.

As promised, *The Battle for Middle-Earth* features deliciously massive battles that do full justice to the films. Playing the forces of good during the siege of Helm's Deep, you can't help but cower in awe as literally thousands of Isengard soldiers march toward your fortress. But while battles of this magnitude are undeniably impressive, they tend to become chaotic and difficult to manage. All too often, the game devolves into building as many units as you can as quickly as possible and sending them off to fight the enemy.

That's not to say the combat doesn't involve any strategy. Each unit has intrinsic strengths and vulnerabilities; for instance, mounted units can mow down foot soldiers by simply riding over them, but cavalry can be handily countered using pikemen. In addition, every hero has powerful special abilities with potential to turn the tide of a battle if used at the right time. And in a nice touch, units and buildings gain veteran status after several battles, increasing their effectiveness and sometimes unlocking new powers.

Technically, *The Battle for Middle-Earth* is a mixed bag. The audio score is great, and the visuals—courtesy of an updated *C&C: Generals* graphics engine—are outstanding. However, you'll need a pretty buff system to play the game at high-detail settings. It ran smoothly on our Athlon 64 3400+ test system with 1GB of RAM and a Radeon 9700 Pro videocard in all but the largest battles. We also found the enemy AI a bit lacking. The computer repeatedly uses the same strategies, and units occasionally do ridiculous things—like standing around haplessly while they're being attacked.

Ultimately, *The Battle for Middle-Earth* doesn't do much to further the RTS genre, but it's a solid game in its own right. The graphics are gorgeous, and the lengthy single-player campaign alone is worth the asking price, especially if you favor quick action over the more tedious elements of real-time strategy.

—OMEED CHANDRA

***The Battle for Middle-Earth* really captures the epic feel of the battle scenes in the movies. Here you see the forces of good attacking Saruman's tower.**

Attack that giant Mumakil, and it'll go crazy and stampede over the enemy forces in front of it.

MAXIMUM PC VERDICT 8

+ GANDALF

Great graphics and sound; fun, fast-paced action; massive battles; satisfying single-player campaign.

– SARUMAN

The larger battles can be chaotic; most of the missions are linear; lackluster AI.

$50, www.eagames.com

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Vampire: The Masquerade—Bloodlines

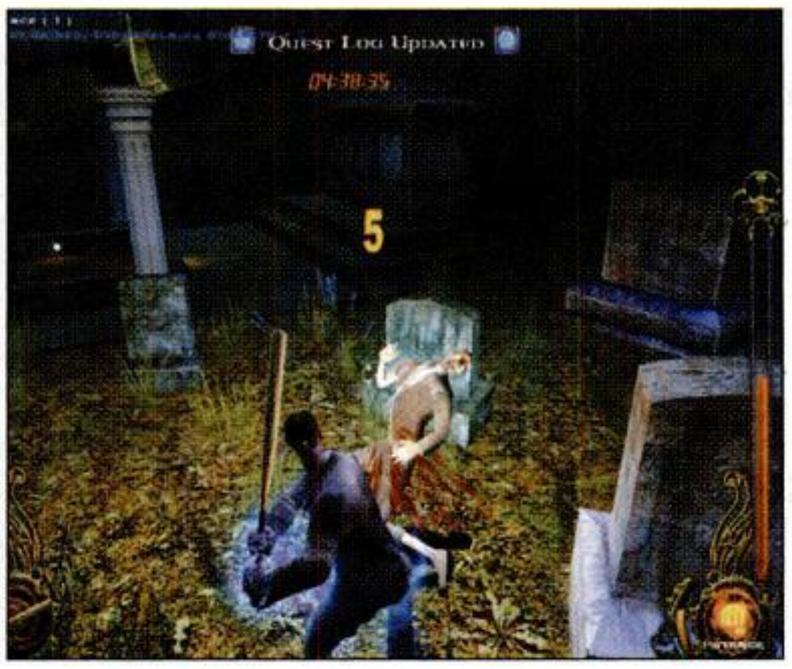
The undead sure know how to quest with the best of them

Troika's latest RPG based on the popular Vampire: The Masquerade universe is chock-full of colorful characters, captivating conspiracies, and an intriguing plotline—all the right ingredients for a great role playing game. But glaring bugs in every aspect of the game—from combat to visuals and everything in between—sour the formula.

As a victim of the "Embrace," you've been turned into a vampire against your will. When your vampire patron is decapitated, you're given pardon by the controlling sect of vampire clans, with the opportunity to prove your usefulness to the vampiric community. The first thing you learn is that Los Angeles is host to a dance of deception between mortals and the undead. Vampires live in coexistence with the rest of the world through the Masquerade, hiding in the shadows and feeding only when necessary. As you perform numerous quests throughout the 30-hour single-player game, you'll discover the secrets and conspiracies brewing among seven opposing vampire clans.

As a role-playing game, *Bloodlines* goes all out in immersing you in a foreboding environment. You'll find yourself interacting with club owners, drug dealers, bounty hunters, and pimps on the bleak streets of LA's Chinatown and the even bleaker underbelly of—*gasp*—Santa Monica. Conversation and dialog is sharp and often witty, and there are enough optional quests to boost your experience and double the minimum length of the game.

Customizing your protagonist happens mostly by way of your attributes and skills, not your appearance. You can advance lock-picking or hacking skills to gain access to new areas or shortcuts, or develop your personality to expose hidden dialog trees. We enjoyed carefully choosing between different skill options—the game doesn't give you enough to max every skill.



It may seem counter-intuitive, but one of our favorite weapons in Bloodlines is the old standby Louisville Slugger. Who knew that they worked on vampires?

Sadly, when the going gets rough, *Bloodlines* falters. Combat is more dependent on your fighting skill levels, than your twitch skills. As a result, you could easily be pummeled to death if you haven't trained gun aiming skills. Melee combat with swords and pipes is preferred, and can be devastating if augmented with temporary vampiric power boosters.

Captivating RPGs are rare for the PC. Despite the fact that the graphics never make the most of *Half-Life 2's* Source engine, and other flaws in the game's execution, *Bloodlines* certainly offers some great role-playing elements.

—NORMAN CHAN

MAXIMUM PC VERDICT 7

+ BLACK DRACULA

Involving storyline with multiple quests and open-ended gameplay.

– BLACULA

Lackluster combat and handicapped animation. Long load times.

$50, www.vampirebloodlines.com

Rumblepad 2

The Rumblepad 2 Vibration Feedback Gamepad is an extremely close, albeit slightly larger, cousin to the PS 2 controller in look, feel, button layout, and function.

The twin vibration feedback motors dish out a considerable amount of tactile response, and you can tweak the level of "rumble" response with the included software. You can also easily reprogram all 10 buttons, download game profiles, and assign shift-button options. The twin analog thumb sticks deliver smooth 360-degree control in games such as *Madden 2005*, and the rubber surface on the underside of the rugged handles ensure a steady grip when the action gets heated.

MAXIMUM PC VERDICT: 9

$30, www.logitech.com

Cordless Rumblepad 2

Clad in black with a snazzy red logo, the Logitech Cordless Rumblepad 2 is identical to the standard Rumblepad 2 in form and function. The "rumble" response isn't quite as boisterous as its corded cousin, but that's to be expected in a dual AA battery-fueled wireless pad. (You can expect 50 to 100 hours of gaming out of each set.)

The pad "connects" to your PC via a small corded USB 2.4GHz receiver, and we're happy to report we didn't notice any lag penalty when compared with the standard Rumblepad 2—even at 10 feet away from our PC.

MAXIMUM PC VERDICT: 10

$40, www.logitech.com

MAXIMUM PC KICK ASS PRODUCT

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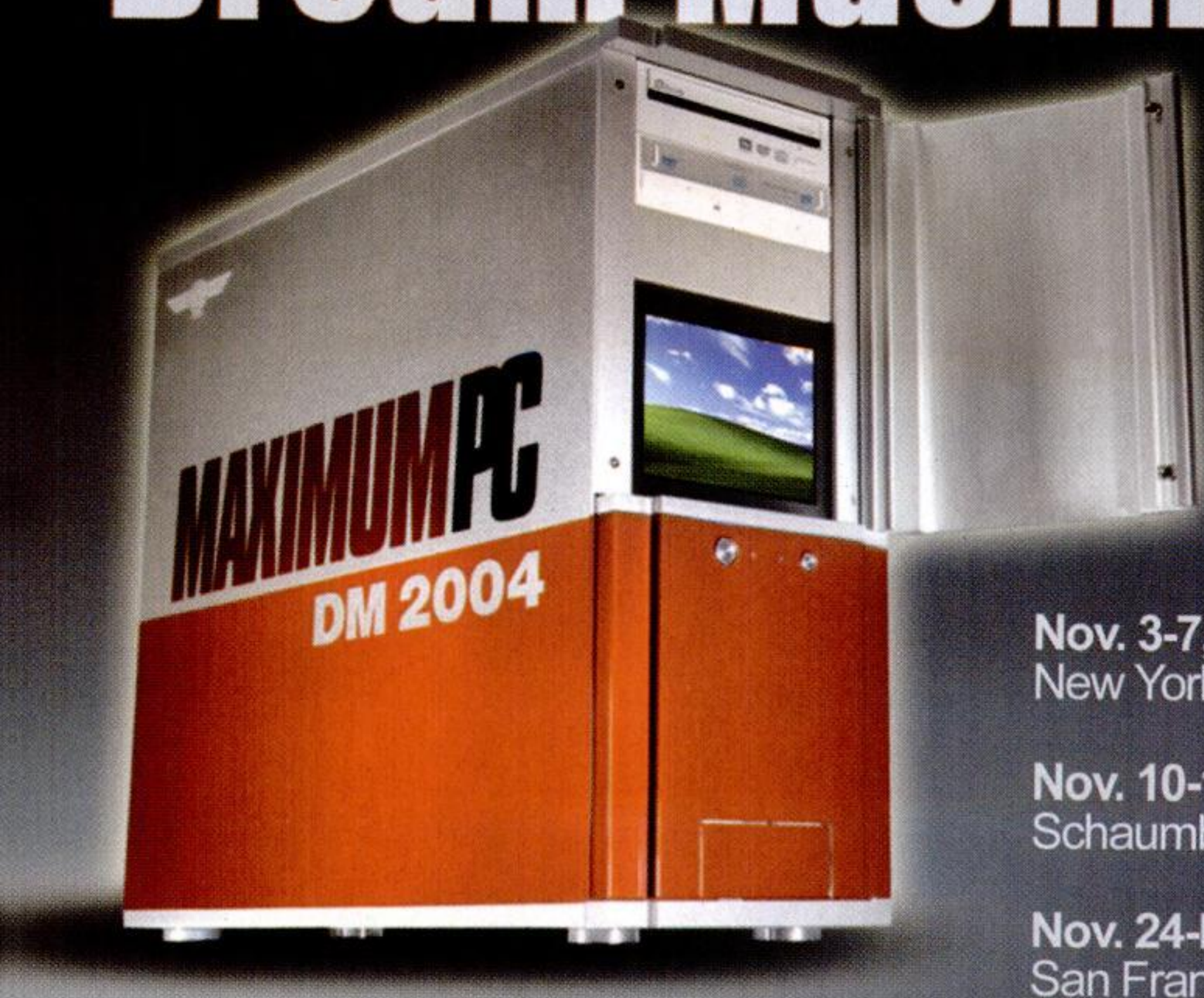

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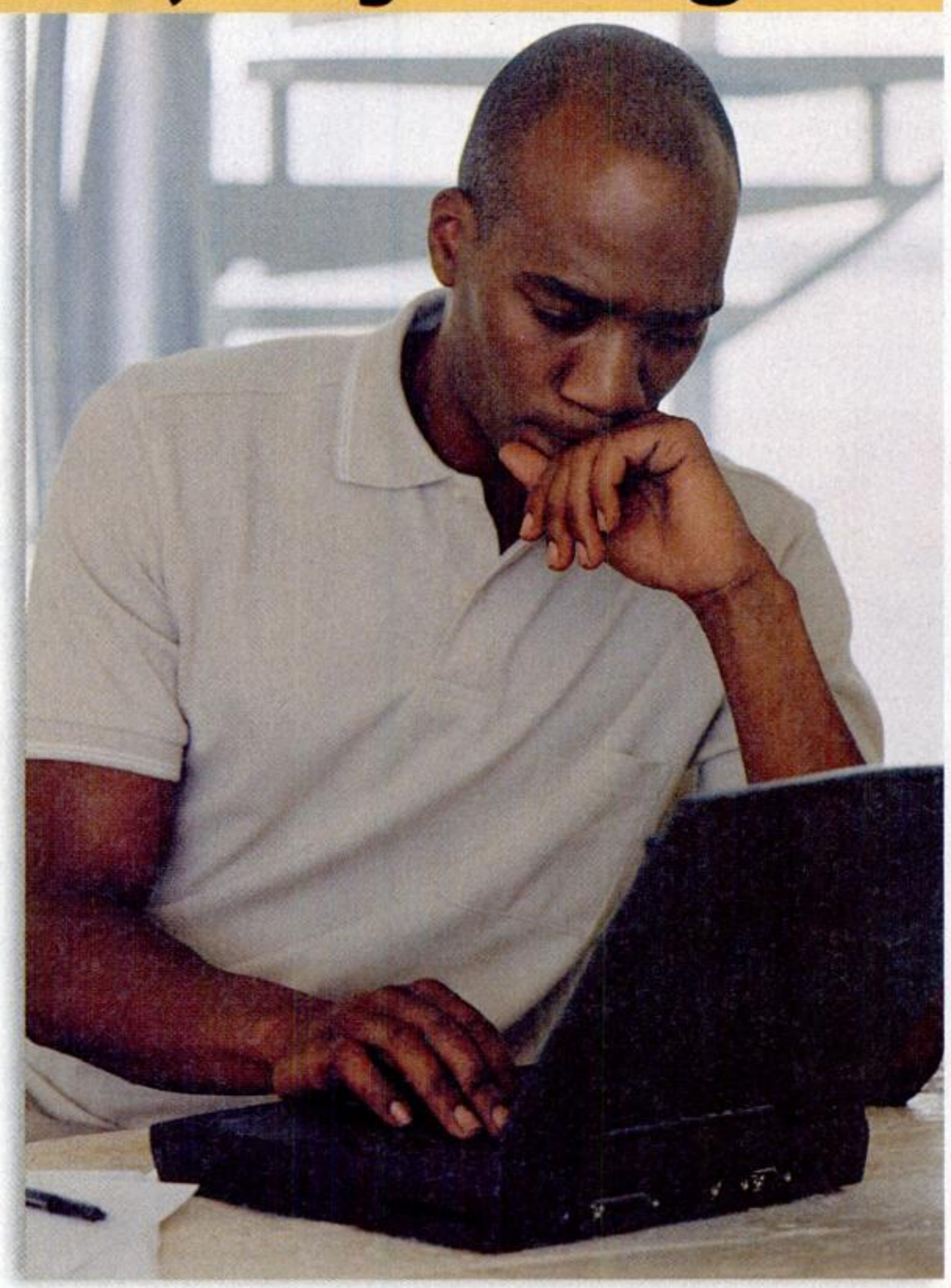

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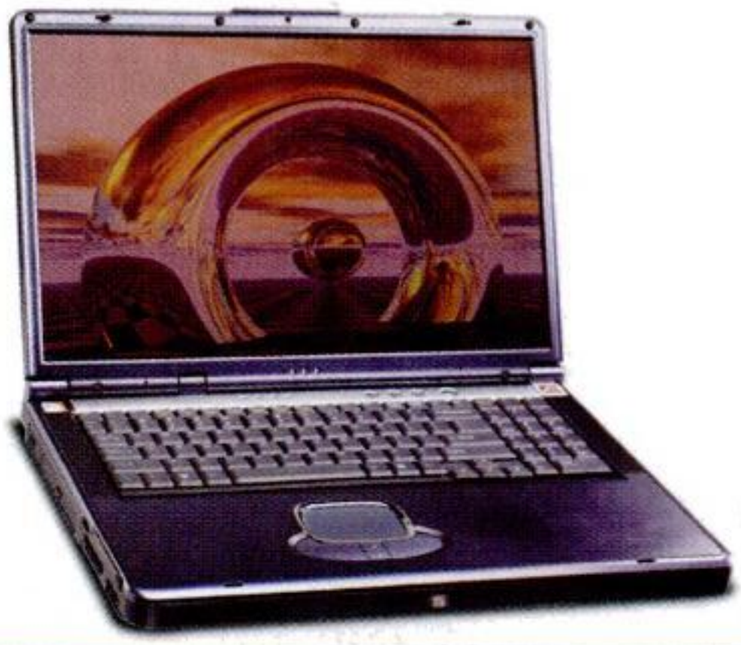

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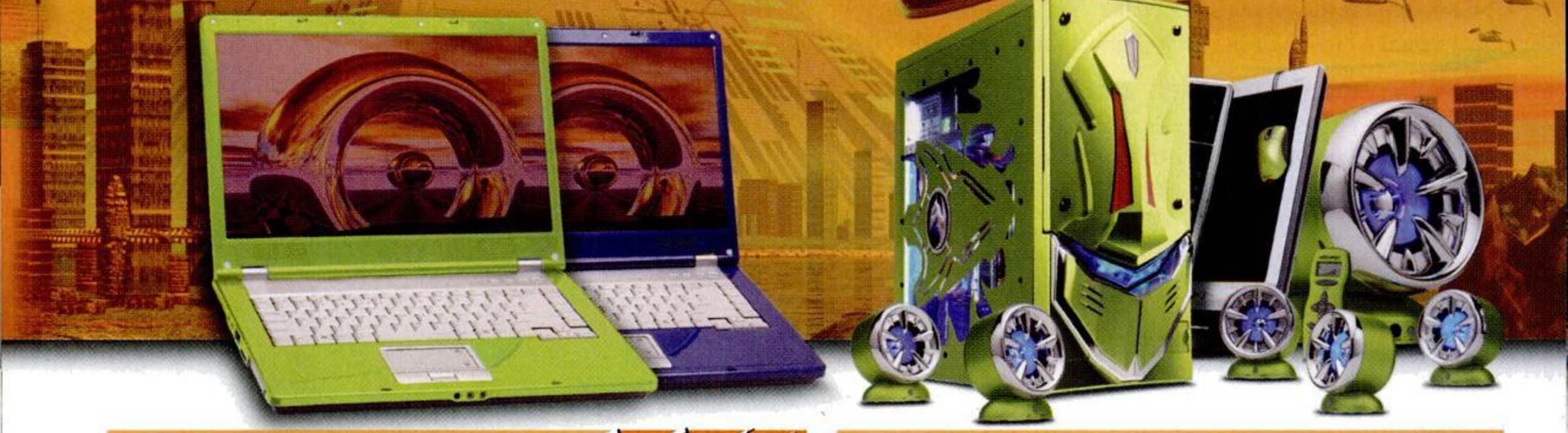

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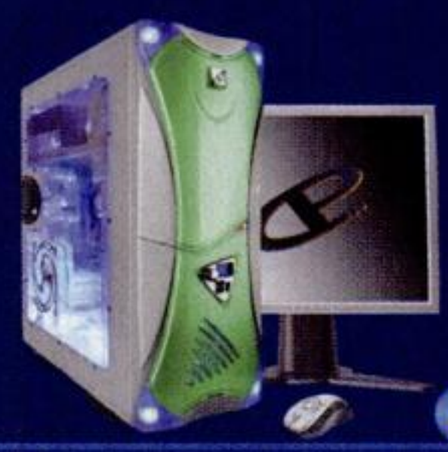

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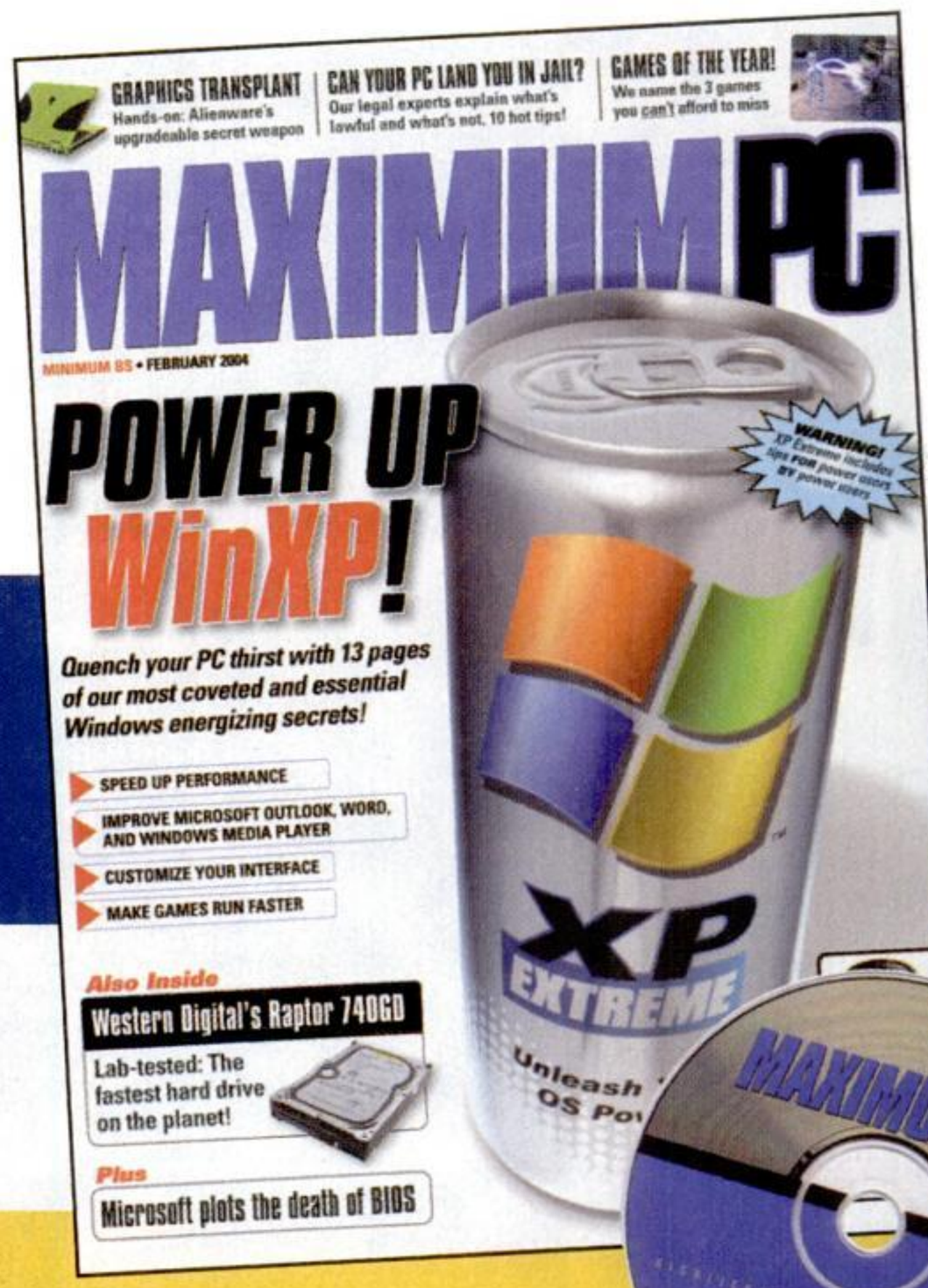
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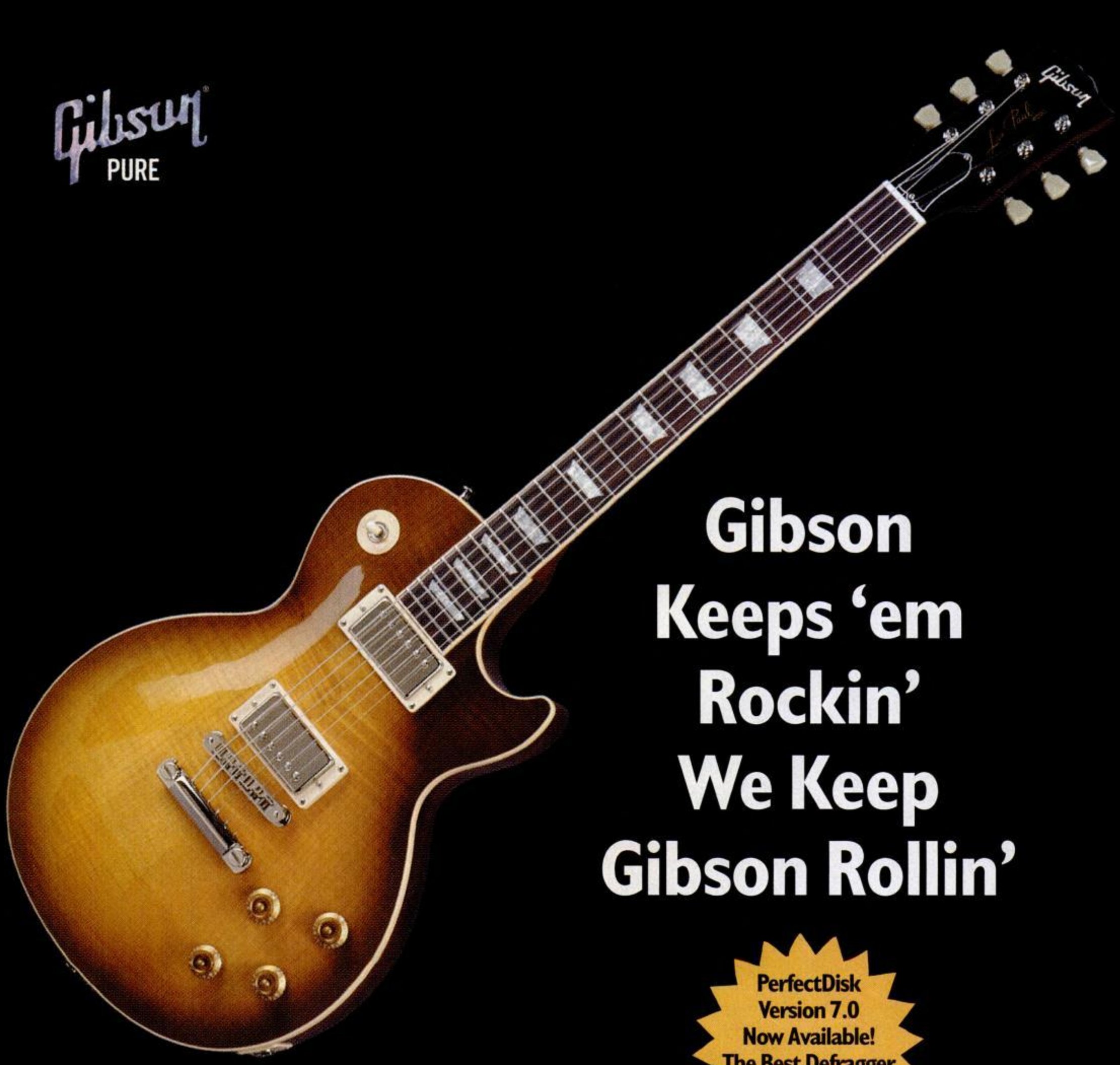

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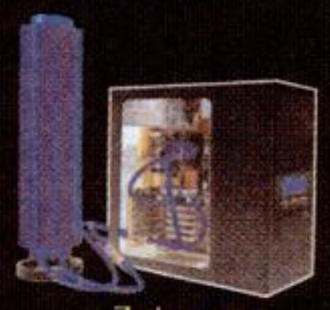
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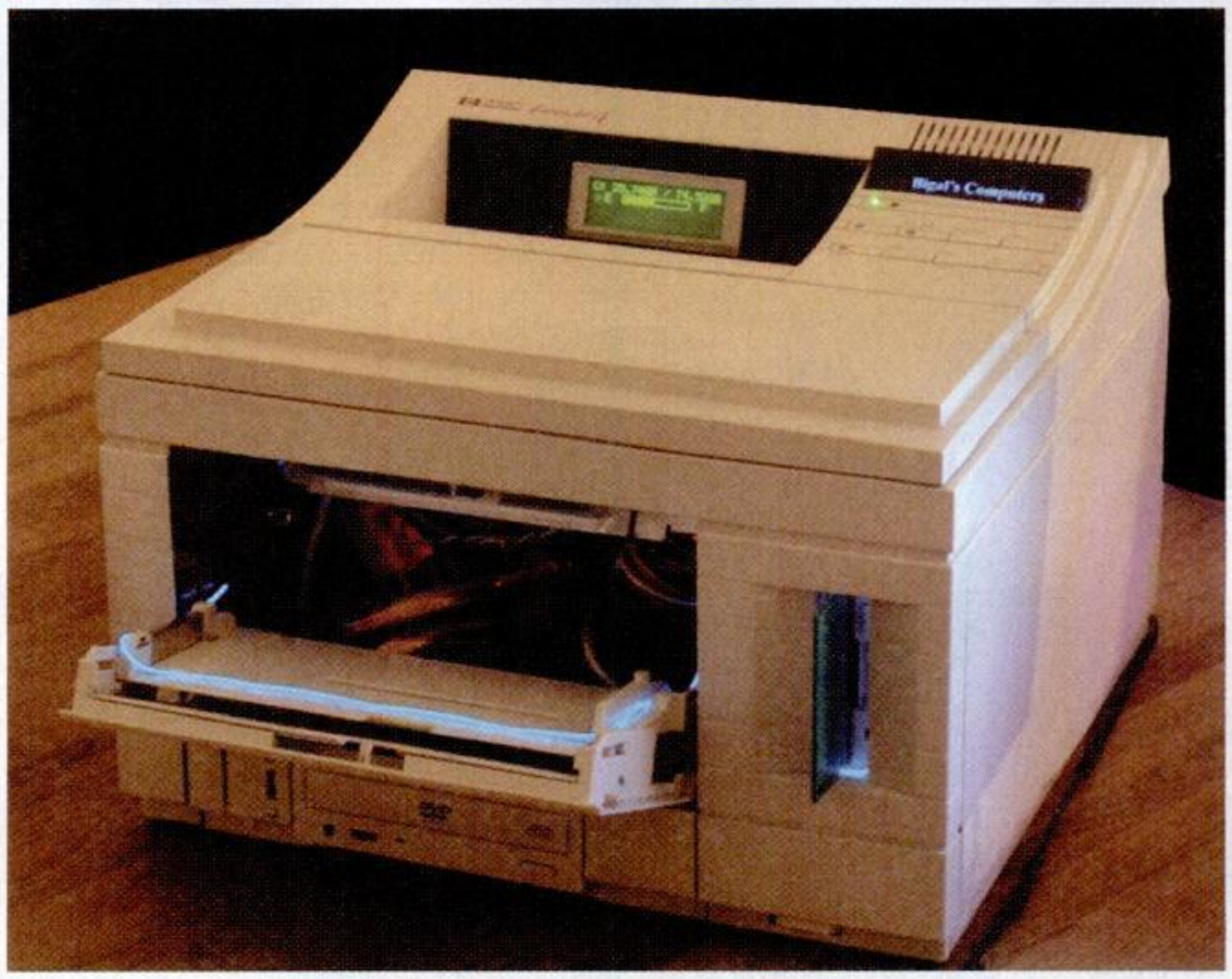
MAXIMUMPC Rig of the Month

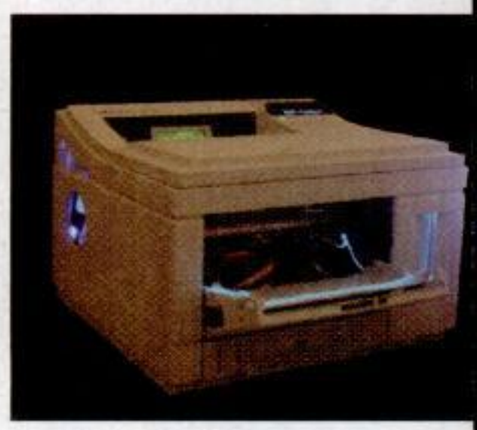
THIS MONTH: Big Al's Printer-to-PC

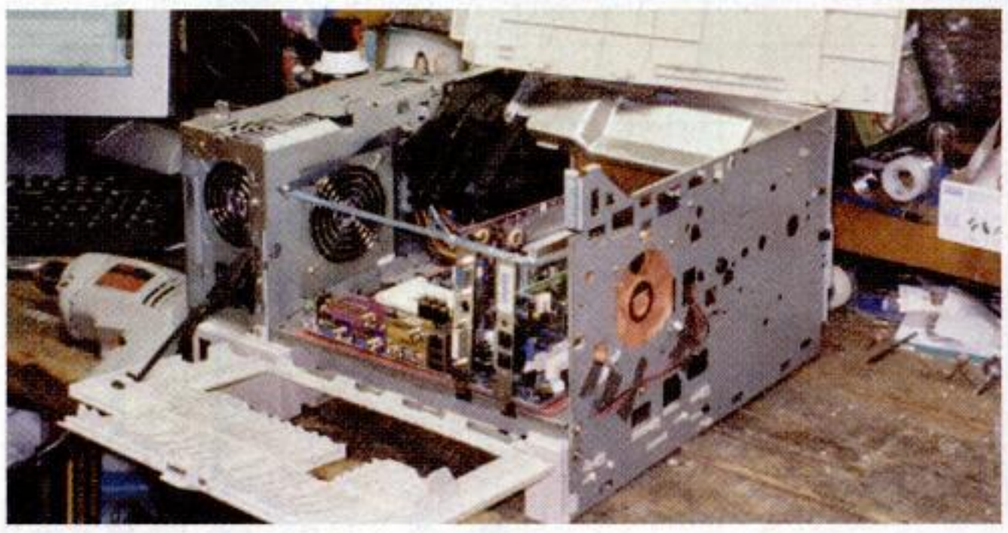
After scoring a crusty HP LaserJet 4 printer in an auction for a measly $6.50 and then discovering it was a lemon, Big Al Haid did what any PC fanatic would—he began kicking the crap out of it. Fortunately, his Load Letter Rage was short-lived; when Haid calmed down, he devised a plan to transform the dingy device into a fully loaded PC.

It wasn't easy. The printer's sectional chassis required extensive modification, which Haid accomplished with a Dremel tool, a lot of patience (the project consumed more than 60 hours of his time), and expert craftsmanship. It's the ultimate stealth PC, and a heartwarming example of how anger can be channeled into something productive.



Here's one way to keep your roommates from using your PC—house the works in the body of an unassuming laser printer. Of course, the hand-cut, glowing HP logo on the side might raise eyebrows.

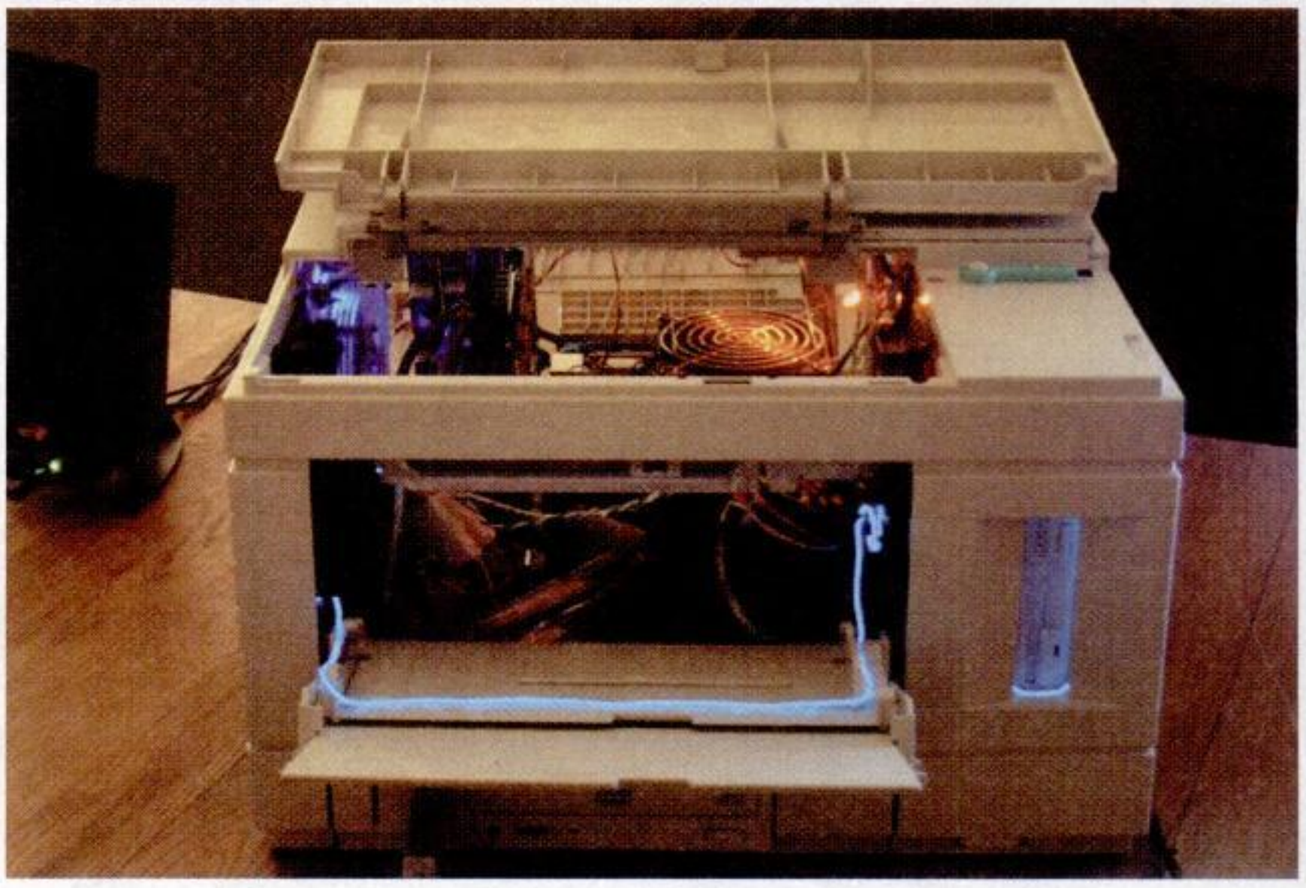


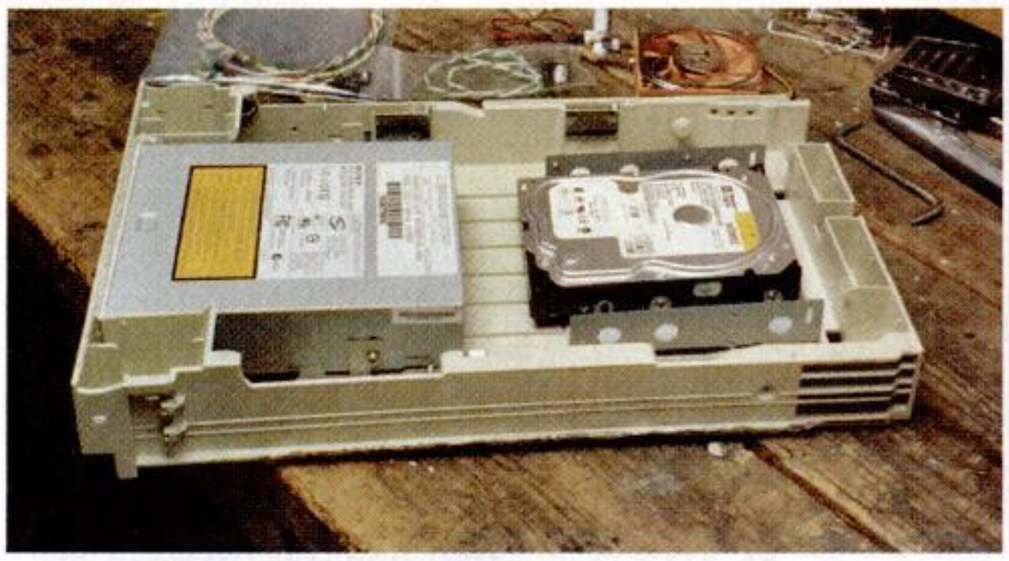


Talk about ingenuity! It's the first time we've heard of someone using hacksaw blades as brackets for the PCI and AGP cards.

Custom touches abound, including an LCD fan monitor and a glowing "Big Al's Computer" backlit stencil.

Haid's next project? "It's hard to say, but I have my eye on an old HP SCSI scanner..."





Haid cleverly used the printer's paper tray as the foundation for his optical drive and hard drive.

If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with high-res digital pics and a 300-word write-up.

MAXIMUM PC (ISSN 1522-4279) is published monthly by Future Network USA, 150 North Hill Drive, Suite 40, Brisbane, CA 94005, USA. Periodical class postage paid in Brisbane, CA, and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (12 issues) US: $20; Canada: $26; Foreign: $42. Basic subscription rates "Deluxe" version (w/CD): one year (12 issues/12 CD-ROMs) U.S.: $30; Canada: $40; Foreign $56. US funds only. Canadian price includes postage and GST (GST#R128220688). Postmaster: Send changes of address to Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659. Standard Mail enclosed in the following edition: none. Ride-Along enclosed in the following editions: B, C, C1, C2, C3, C4. Int'l Pub Mail# 0781029. Canada Post Publications Mail Agreement #40043631. Returns: 4960-2 Walker Road, Windsor ON N9A 6J3. For customer service, write Maximum PC, P.O. Box 5159, Harlan, IA 51593-0659; Maximum PC, 150 North Hill Drive, Brisbane, CA 94005. Future Network USA also publishes PC Gamer, PSM, MacAddict, and Official Xbox. Entire contents copyright 2003, Future Network USA. All rights reserved. Reproduction in whole or in part is prohibited. Future Network USA is not affiliated with the companies or products covered in Maximum PC. PRODUCED AND PRINTED IN THE UNITED STATES OF AMERICA.

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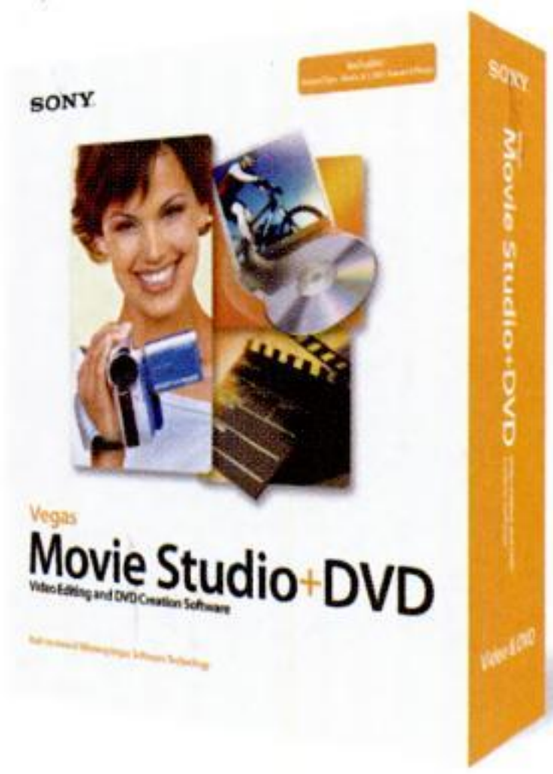

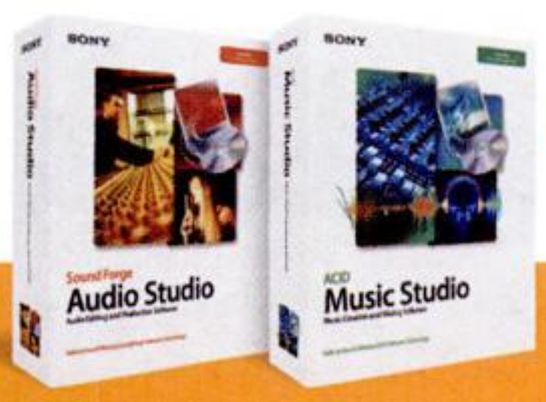

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